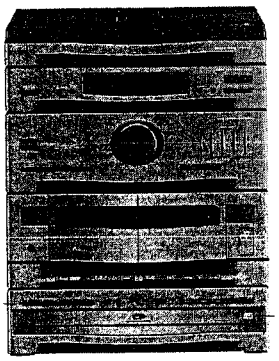
Midi System AS640/20, /20B, /21, /22, /25, /37

AS641/37
AS642/37
AS645/21, /30

Service
Service
Service



Service Manual

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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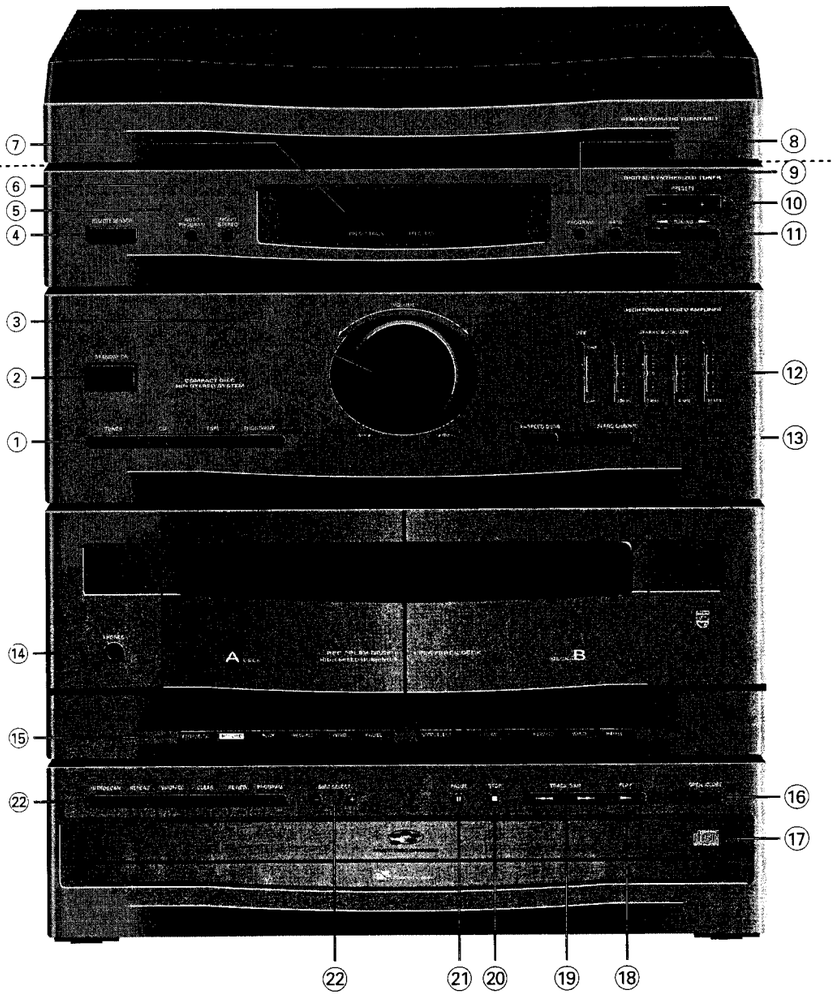

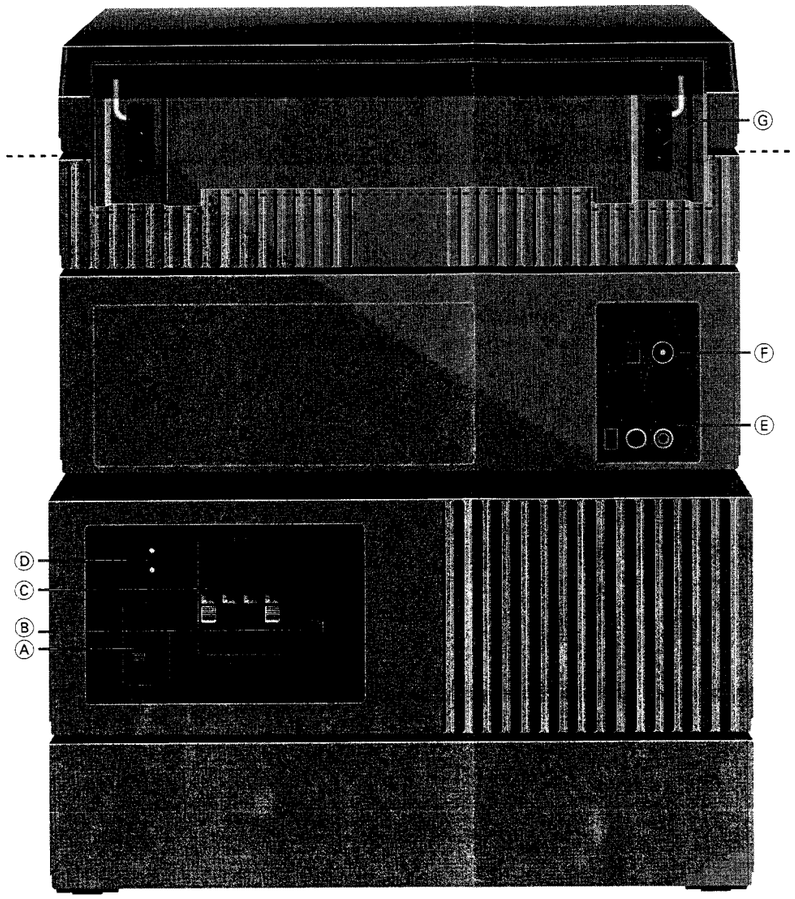

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- CD 1438
- Tape 1444
- Phono/Aux 1437

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- for ECO 4 Tuner — see page 40
- FM aerial socket.....1110
- for Tuner 92 — see page 46

Specification

General:

Mains voltage	:	220V / 50Hz for /20, /22
	:	240V / 50Hz for /25
	:	120V or 230V /50Hz via voltage selector for /21, /30
	:	120V / 60Hz for /37
Power consumption	:	≤ 85 W at maximum output power
	:	≤ 10 W in stand by

Amplifier:

Output power	:	2 x 15W at 6Ω D=10%
Music power	:	2 x 45W at 6Ω
Headphone	:	6,3mm stereo jack 25mW at 32Ω (≡0,9V at 32Ω)
Power stage protection	:	Temperature
Frequency response	:	63 Hz - 14 kHz (-3dB) Limit
	:	63 Hz - 17 kHz (-3dB) Typical value
Tone control		
DBB	:	±6dB at 100 Hz
300 Hz	:	±6dB at 300 Hz
1 kHz	:	±6dB at 1 kHz
4 kHz	:	±6dB at 4 kHz
10 kHz	:	±6dB at 10kHz
Input sensitivity		
PHONO/LINE	:	350 mV

Tuner:

	FM	MW	LW
Tuning range	87,5 - 108 MHz Grid 50 kHz	522 - 1611 kHz (Grid 9kHz) 530 - 1700 kHz (only for /37) (Grid 10kHz)	153 - 297 kHz (Grid 3kHz)
Aerial input	Coax F-Connector 75 Ω	Ferrite antenna	Ferrite antenna
IF	10,7 MHz ± 25 kHz	450 kHz ± 1 kHz	450 kHz ± 1 kHz
Sensitivity Mono : 26dB S/N Stereo : 46dB S/N Search tuning	≤ 4 µV (2 µV typ.) ≤ 45 µV 7 µV typ.	3 mV/m (1,5 mV/m typ.) ≤ 6mV/m	≤ 6 mV/m ≤ 6mV/m
Distortion	≤3% (2% typ.) RF=1mV Δf=75kHz	≤5% (3% typ) RF=100mV/m m=80%	≤5% (3% typ) RF=100mV/m m=80%
Channel separation	≥26dB (30dB typ)	-	-
Image rejection ratio	30 dB (40 dB typ.)	27 dB (30 dB typ.)	40 dB (43 dB typ.)
-3 dB limiting point	≤ 5 µV (2 µV typ.)		

CD unit:

Have to be measured direct on internal connector 1815

Frequency response	:	20 - 20.000 Hz ±2 dB
Output level	:	2V ±3 dB
Signal/noise ratio	:	≥90 dB
Distortion	:	≤1% at 1 kHz
Channel difference	:	≤2 dB at 1 kHz
Channel crosstalk	:	50 dB max.
De emphasis	:	0 or 15/50µs switched automatically by subcode on the disc
Laser		
Output power	:	≤500µW
Wave length	:	780 ± 20 nm

Recorder part:

Tape speed	: 4,76cm/s ±2% in **N**ormal **S**peed
	: 8,5cm/s ±12% in **H**igh **S**peed **D**ubbing
Wow & Flutter	: ≤0,4%
Winding speed	: ≤ 130s for C60 cassette
Erase / Bias system	: AC 60kHz
RIF-shift	: service solution on request
Distortion at 200 nWb/m	: ≤ 5%
Channel difference at PB	: ≤ 3dB
Channel difference overall	: ≤ 3dB
Channel separation	: ≥ 18dB at 1kHz
Track separation	: ≥ 55dB at 1kHz

Phono part:

Power supply	: 12V DC / 80mA
Wow & Flutter	: 0,25% JIS
	: 0,35% DIN
Operating speed	: 33⅓ and 45 rpm
Drive system	: Belt drive with automatic return

	IEC I	IEC I (dubbing)	IEC II	IEC II (dubbing)	Dubbing HS[3)]
Frequency response -8 dB[1)]	100Hz - 10kHz	125Hz - 8kHz	100Hz - 10kHz	125Hz - 8kHz	125Hz - 8kHz
Signal to Hiss ratio[2)] A-weighted	≥ 45 dB	≥ 45 dB	≥ 45 dB	≥ 45 dB	
Signal to Noise ratio[2)] FF-weighted	≥ 40 dB	≥ 40 dB	≥ 40 dB	≥ 40 dB	
Erase attenuation [4)]	≥ 55 dB	≥ 55 dB	≥ 55 dB	≥ 55 dB	

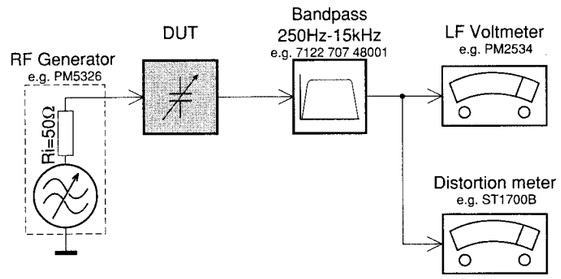
[1)] typical value [2)] at 250 nWb/m [3)] at -10dB [4)] Use a 1kHz passfilter to minimize the wide band noise component.

The set reacts on following RC5 commands:

	Systemcode	Commandcode
Stand by	17,20,21	12
Tuner	17	63
Aux/Phono	21	63
CD	20	63
Volume up	16	16
Volume down	16	17
Repeat	20	29
Shuffle	20	28
Scan	20	43
Play (CD)	20	53
Pause (CD)	20	48
Next (CD)	20	32
Previous (CD)	20	33
Search Forward (CD)	20	52
Search Backward (CD)	20	50
Stop (CD)	20	54
Tuning up	17	30
Tuning down	17	31
Preset up	17	32
Preset down	17	33

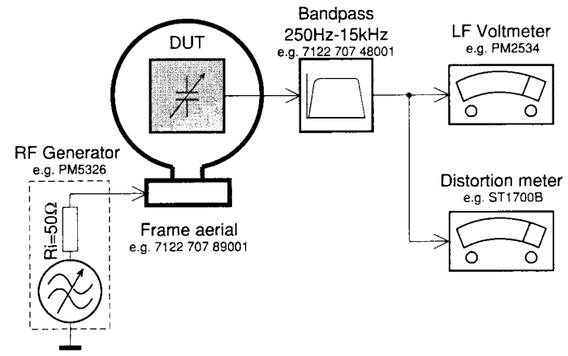
Measurement setup

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

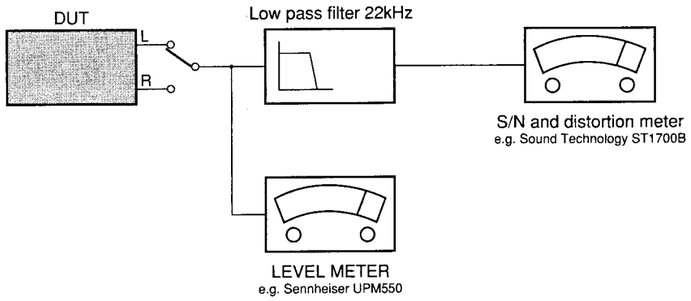
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)
L.P.F. = 13th order filter 4822 395 30204



DUT..... **D**evice **U**nder **T**est

Version table (Quick reference)

	AS640 /20	AS640 /20B	AS640 /21	AS640 /22	AS640 /25	AS640 /37	AS641 /37	AS642 /37	AS645 /21	AS645 /30
Mains cord										
4822 321 10954										x
4822 321 10831	x	x	x	x					x	
4822 321 10883						x	x	x		
4822 321 10918					x					
Mains transformer										
4822 146 31244	x	x		x						
4822 146 31245						x	x	x		
4822 146 31246			x		x				x	x
Mains socket										
4822 265 31015	x	x	x	x	x				x	x
4822 265 31016						x	x	x		
Voltage selector										
4822 272 10269			x						x	x
IR Remote control										
4822 218 10513	x	x	x	x	x	x	x	x	x	x
Loudspeaker box										
4822 445 10362	x			x	x					
4822 445 10365						x				
4822 445 10366		x	x						x	x
4822 445 10368							x	x		
Tuner										
ECO4 Tuner	x	x	x		x	x	x	x	x	x
Tuner 92				x						
Record player										
DL-40									x	x
Micro Mix function										
available								x		

Service tools

TORX screwdriver set SBC 163	4822 395 50145
Audio signal disc SBC 429	4822 397 30184
Test disc 5 (disc without errors)	
Test disc 5A (disc with dropout errors, black spots and finger prints) SBC 426/426A	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30dB level without "pause")	4822 397 30155
Universal **test cassette Fe** SBC 420	4822 397 30071
Universal **test cassette CrO_2** SBC 419	4822 397 30069

SERVICE HINTS

SERVICE POSITION for
Servicing Front, Recorder Board and Tape transports

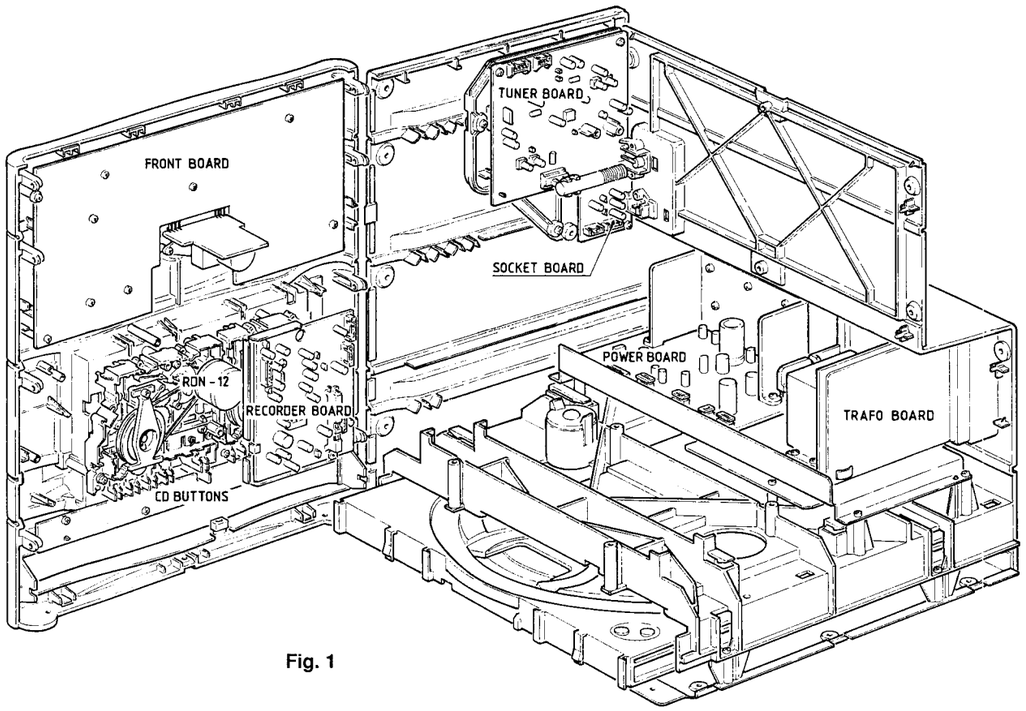


Fig. 1

1) Remove top cover as shown in picture 1.
2) Remove front of CD tray as shown in Fig. 2.
3) Remove right side of cabinett (11 screws).
4) Remove front (7 screws) and turn whole front aside as shown in Fig. 1.

Dismantling Front of CD Tray

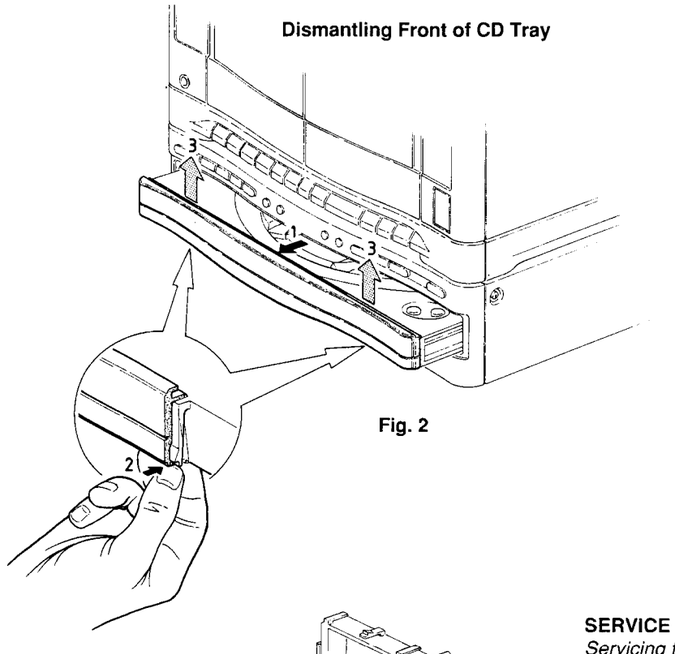
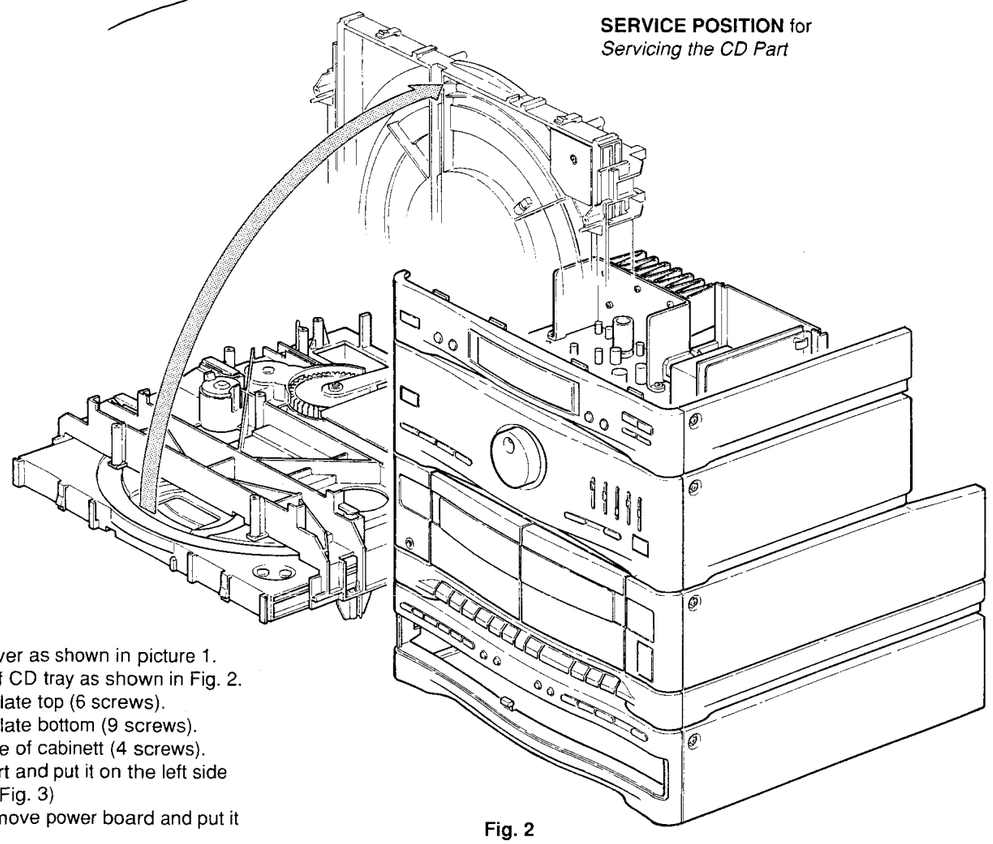


Fig. 2

SERVICE POSITION for
Servicing the CD Part



1) Remove top cover as shown in picture 1.
2) Remove front of CD tray as shown in Fig. 2.
3) Remove back plate top (6 screws).
4) Remove back plate bottom (9 screws).
5) Remove left side of cabinett (4 screws).
6) Remove CD part and put it on the left side of the set. (see Fig. 3)
7) If necessary remove power board and put it behind the set.

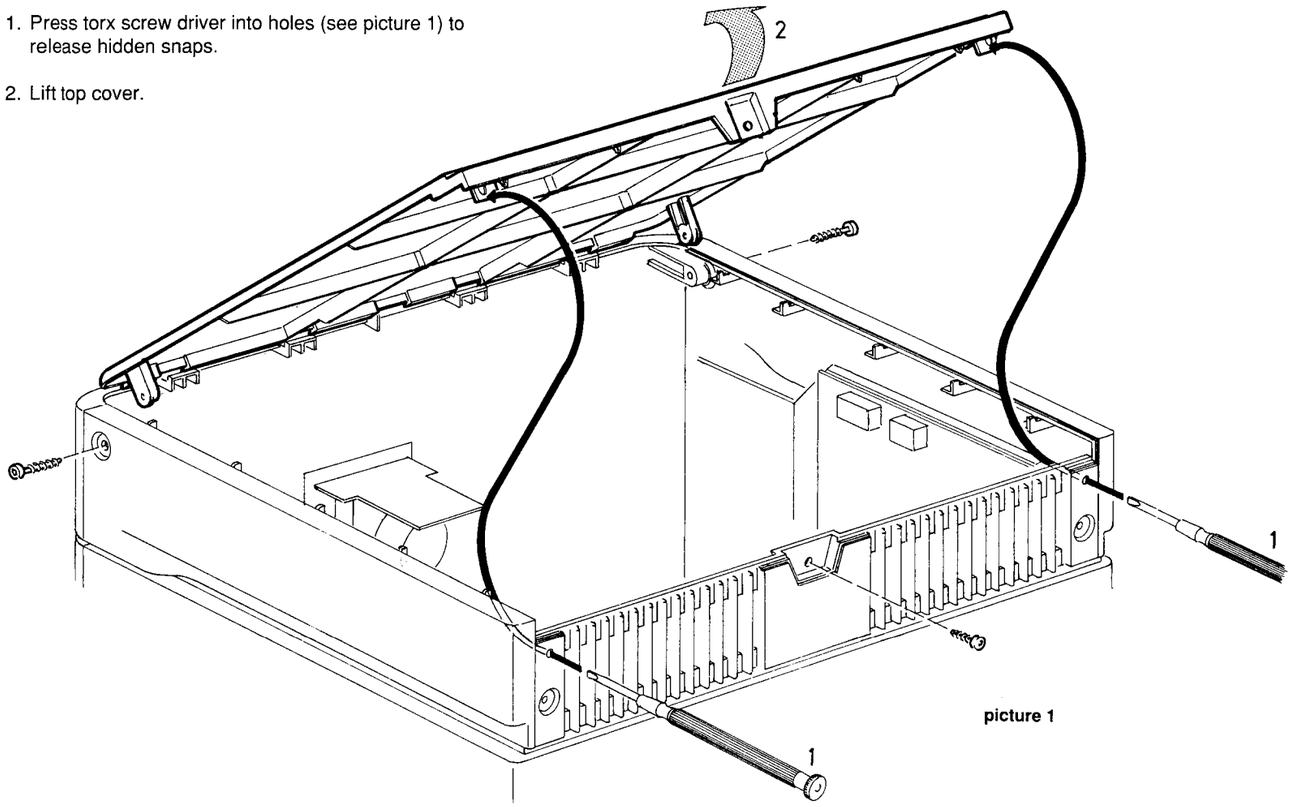
Fig. 2

Dismantling Hints

Dismantling of Top Cover

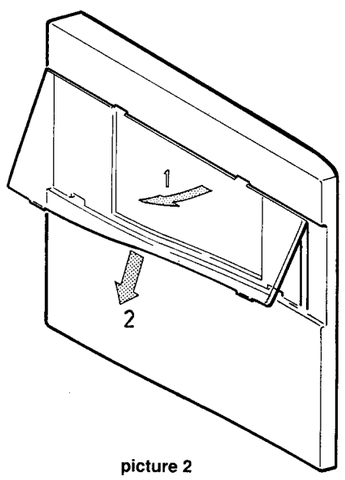
Remove 3x screws.

1. Press torx screw driver into holes (see picture 1) to release hidden snaps.
2. Lift top cover.



picture 1

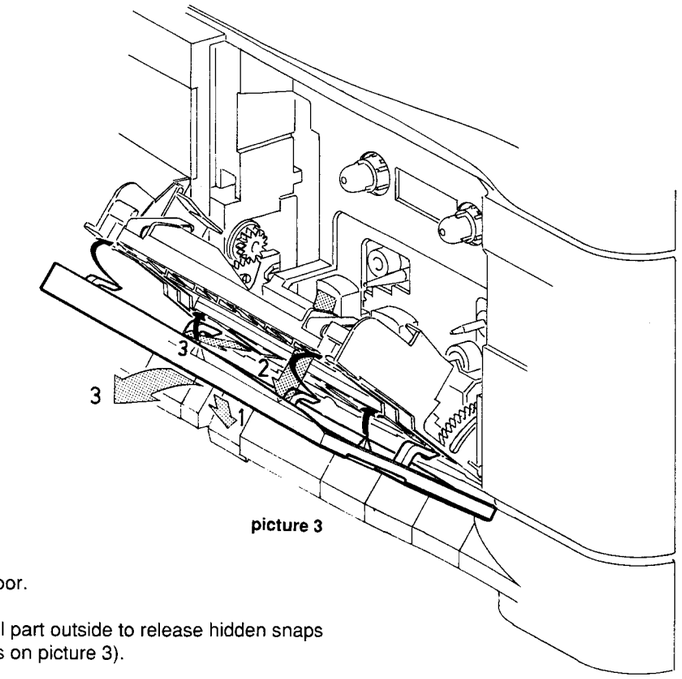
Dismantling Window of Cassette Door



picture 2

1) Press the window outside as shown in picture 2. You don´t need any tool.

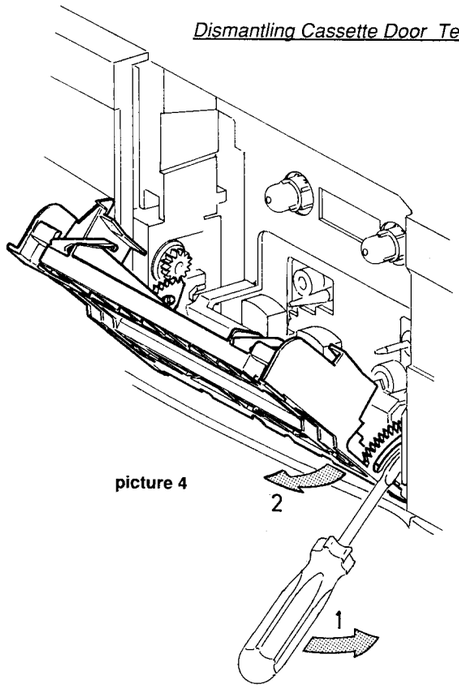
Dismantling Cassette Door Ornamental Part



picture 3

1) Open cassette door.
2) Press ornamental part outside to release hidden snaps (see black arrows on picture 3).
3) Pull ornamental part upwards.

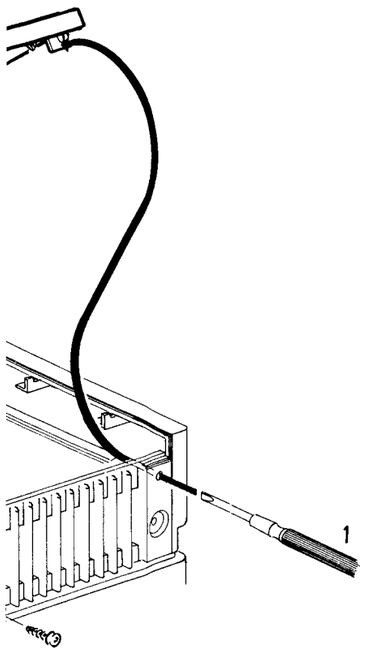
Dismantling Cassette Door Technical Part



picture 4

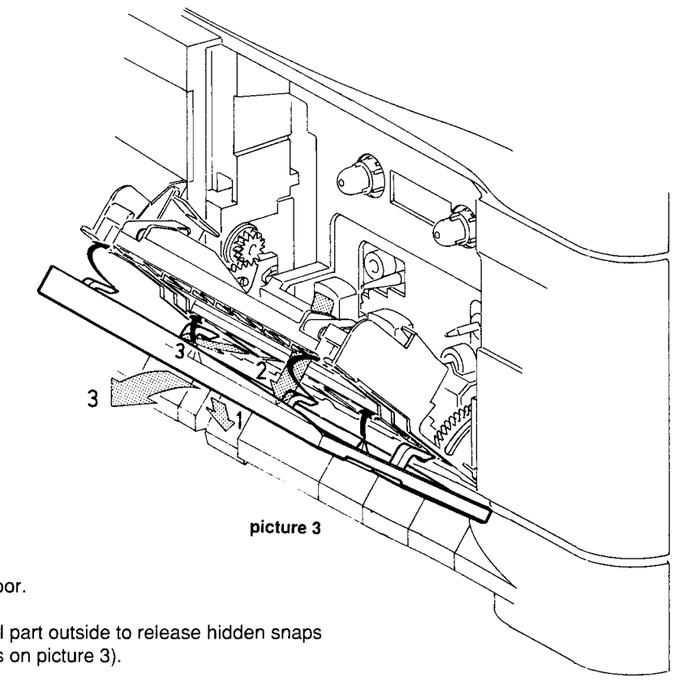
Remove ornamental part first.

1) Bend tooth segment with a screw driver to release snap as shown in picture 4.
2) Pull cassette door outside.



picture 1

Dismantling Cassette Door Ornamental Part



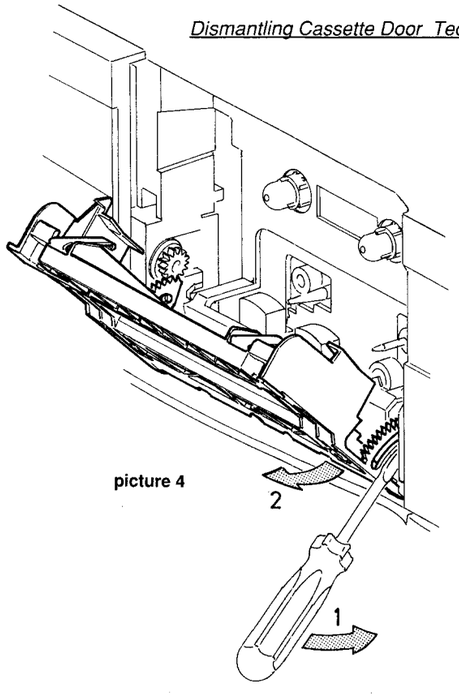
picture 3

1) Open cassette door.

2) Press ornamental part outside to release hidden snaps (see black arrows on picture 3).

3) Pull ornamental part upwards.

Dismantling Cassette Door Technical Part



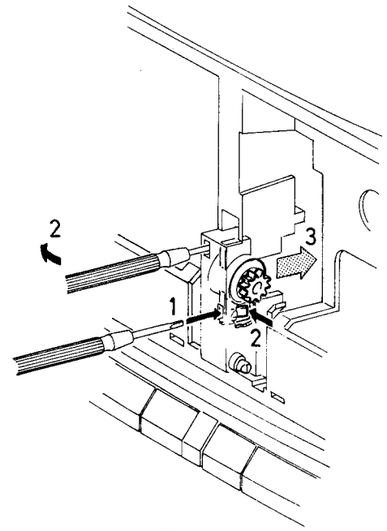
picture 4

Remove ornamental part first.

1) Bend tooth segment with a screw driver to release snap as shown in picture 4.

2) Pull cassette door outside.

Dismantling of Damper



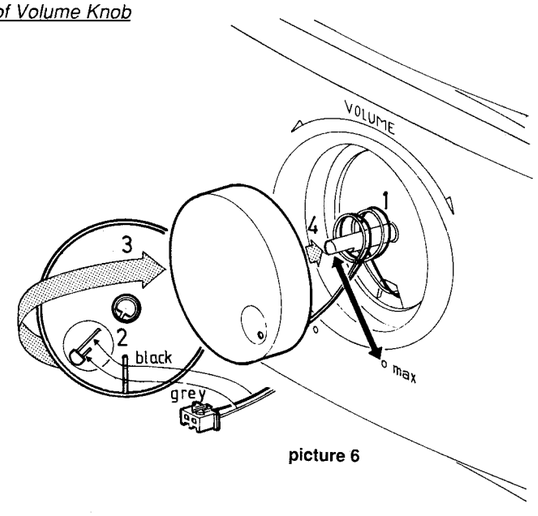
picture 5

Remove Tape Transports and bracket (506) first.

1+2) Release two snaps as shown in picture 5.

3) Pull damper outside.

Mounting of Volume Knob



picture 6

1) Turn Volume pot to max. (clockwise)

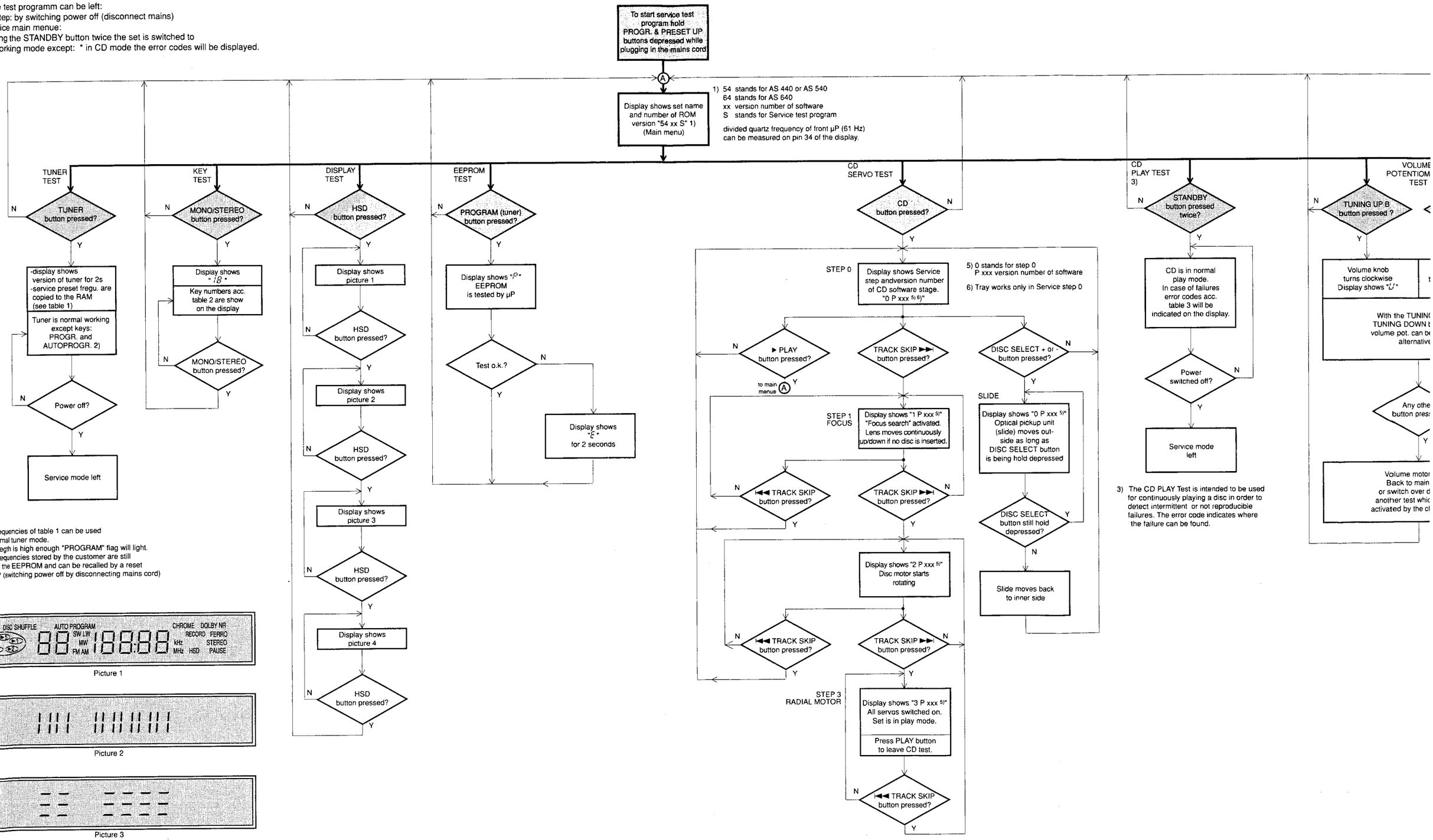
2) Pay attention to the polarity of the LED.

3) Turn the cable two times clockwise onto the axle.

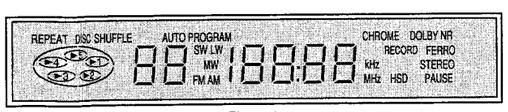
4) Insert the knob.

SERVICE TEST PROGRAM

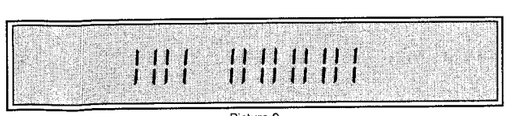
The service test programm can be left:
– at each step: by switching power off (disconnect mains)
– from service main menue:
by pressing the STANDBY button twice the set is switched to normal working mode except: * in CD mode the error codes will be displayed.

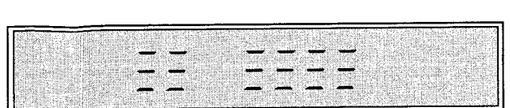


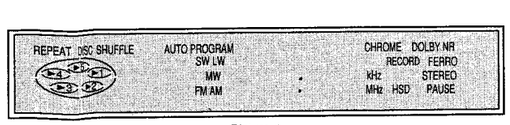
2) Preset frequencies of table 1 can be used as in normal tuner mode.
If fieldstregth is high enough "PROGRAM" flag will light.
Preset frequencies stored by the customer are still stored in the EEPROM and can be recalled by a reset of the µP (switching power off by disconnecting mains cord)



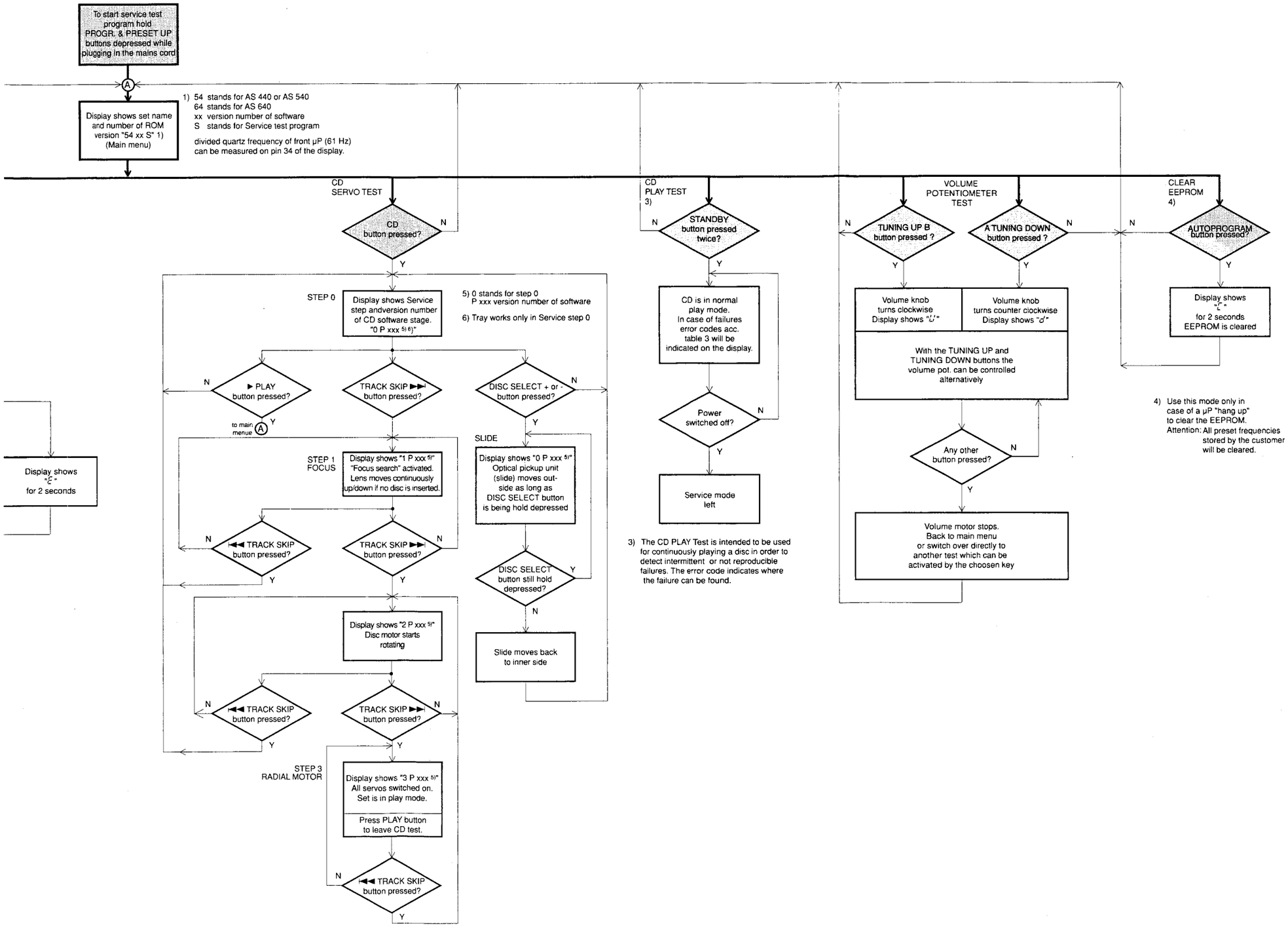
Picture 1


Picture 2


Picture 3



Picture 4


To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
A
Display shows set name and number of ROM version "54 xx S" 1) (Main menu)
1) 54 stands for AS 440 or AS 540
64 stands for AS 640
xx version number of software
S stands for Service test program
divided quartz frequency of front µP (61 Hz) can be measured on pin 34 of the display.
CD SERVO TEST
CD button pressed?
N
Y
STEP 0
Display shows Service step andversion number of CD software stage. "0 P xxx 5) 6)"
5) 0 stands for step 0
P xxx version number of software
6) Tray works only in Service step 0
► PLAY button pressed?
TRACK SKIP ►►| button pressed?
DISC SELECT + or - button pressed?
to main menue
A
STEP 1 FOCUS
Display shows "1 P xxx 5)" "Focus search" activated. Lens moves continuously up/down if no disc is inserted.
SLIDE
Display shows "0 P xxx 5)" Optical pickup unit (slide) moves out-side as long as DISC SELECT button is being hold depressed
|◄◄ TRACK SKIP button pressed?
TRACK SKIP ►►| button pressed?
DISC SELECT button still hold depressed?
Slide moves back to inner side
Display shows "2 P xxx 5)" Disc motor starts rotating
|◄◄ TRACK SKIP button pressed?
TRACK SKIP ►►| button pressed?
STEP 3 RADIAL MOTOR
Display shows "3 P xxx 5)" All servos switched on. Set is in play mode.
Press PLAY button to leave CD test.
|◄◄ TRACK SKIP button pressed?
Display shows "E" for 2 seconds
CD PLAY TEST 3)
STANDBY button pressed twice?
CD is in normal play mode. In case of failures error codes acc. table 3 will be indicated on the display.
Power switched off?
Service mode left
3) The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittent or not reproducible failures. The error code indicates where the failure can be found.
VOLUME POTENTIOMETER TEST
TUNING UP B button pressed ?
A TUNING DOWN button pressed ?
Volume knob turns clockwise Display shows "U"
Volume knob turns counter clockwise Display shows "d"
With the TUNING UP and TUNING DOWN buttons the volume pot. can be controlled alternatively
Any other button pressed?
Volume motor stops. Back to main menu or switch over directly to another test which can be activated by the choosen key
CLEAR EEPROM 4)
AUTOPROGRAM button pressed?
Display shows "C" for 2 seconds EEPROM is cleared
4) Use this mode only in case of a µP "hang up" to clear the EEPROM.
Attention: All preset frequencies stored by the customer will be cleared.

	VERSION						
	EUR	EAS	USA	EUS	OSE	OSS	
PRESET	Europe 3-band	East Europe 3-band	USA 2-band	Europe 4-band	Oversea 2-band	Oversea 3-band	UNIT
1	87,5	65,81	87,5	87,5	87,5	87,5	MHz
2	108	74	108	108	108	108	MHz
3	98	87,5	98	98	98	98	MHz
4	89,7	108	89,7	89,7	89,7	89,7	MHz
5	93	98	93	93	93	93	MHz
6	104,9	89,7	104,9	104,9	104,9	104,9	MHz
7	522	93	530	522	530	530	kHz
8	1611	104,9	1710	1611	1710	1710	kHz
9	540	522	540	540	540	540	kHz
10	549	1611	550	549	550	550	kHz
11	558	540	560	558	560	560	kHz
12	1494	549	1500	1494	1500	1500	kHz
13	153	558	1600	153	1600	1600	kHz
14	279	1494	1000	279	1000	3900	kHz
15	156	153		156		12100	kHz
16	198	279		198		4250	kHz
17	270	156		270		8000	kHz
18	999	198		5900		11900	kHz
19		270		18100		1000	kHz
20		999		6200			kHz
21				17000			kHz
22				12000			kHz
23				999			kHz

table 1

Key activated	Display shows	Key activated	Display shows
Tuning up	01	Autoprogram	17
Tuning down	03	Mono / Stereo	18
Preset up	04	Tuner	19
Preset down	02	Stand by	20
—	—	Tape	21
Band	06	Phono / Aux	22
Program(Tuner)	07	CD	23
Fe/Cr	08	—	—
Disc Select –	09	Track skip ≫	25
Disc Select +	10	—	—
Review	11	Open / Close	27
Program (CD)	12	Play (CD)	28
HS dubbing	13	Clear	29
Pause (CD)	14	Shuffle	30
≪ Track skip	15	Introscan	31
Stop (CD)	16	Repeat	32

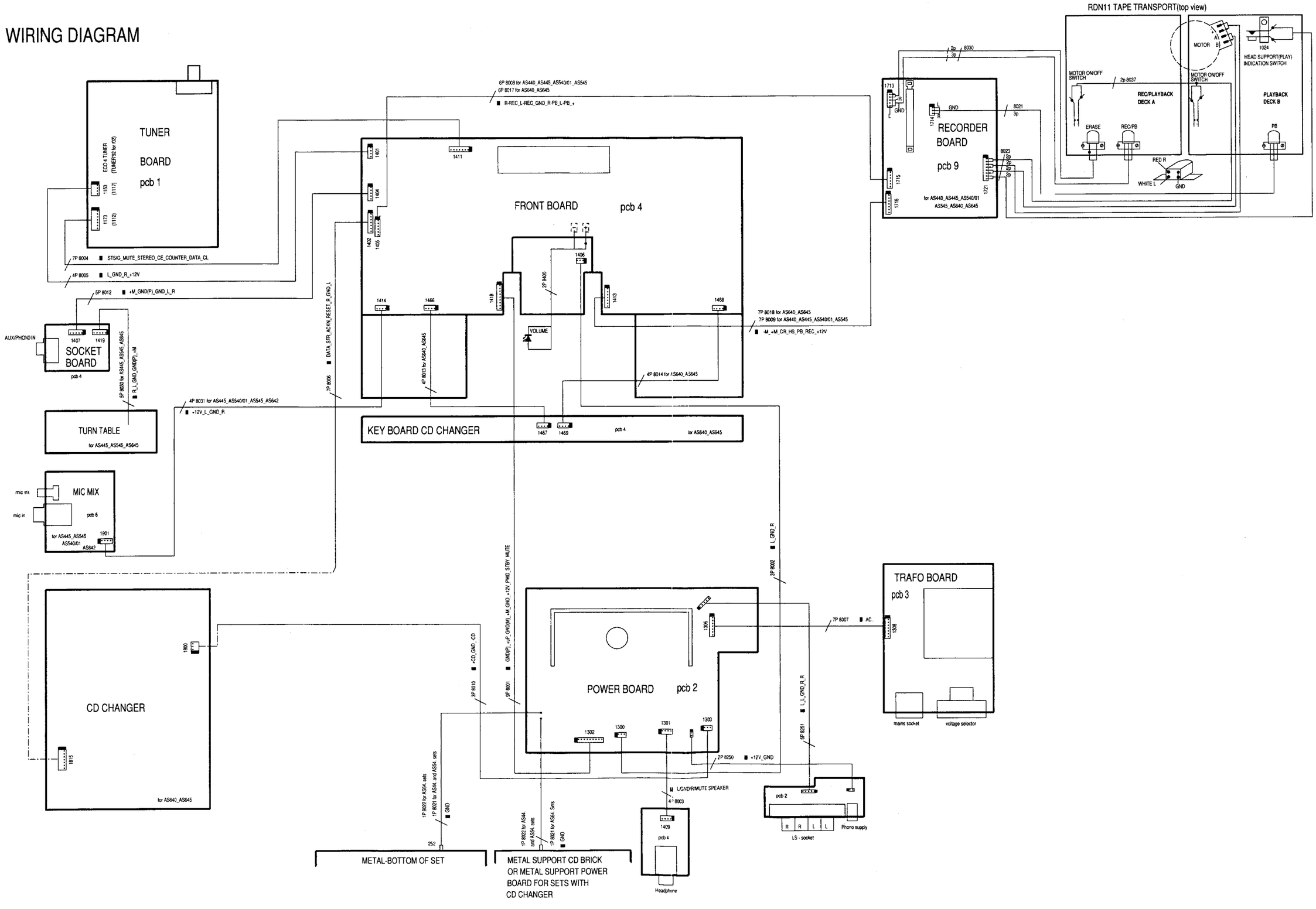
table 2

If a key is activated at the remote control, ⌐ ⌙ is shown additionally to the key number as long as the key is hold depressed.

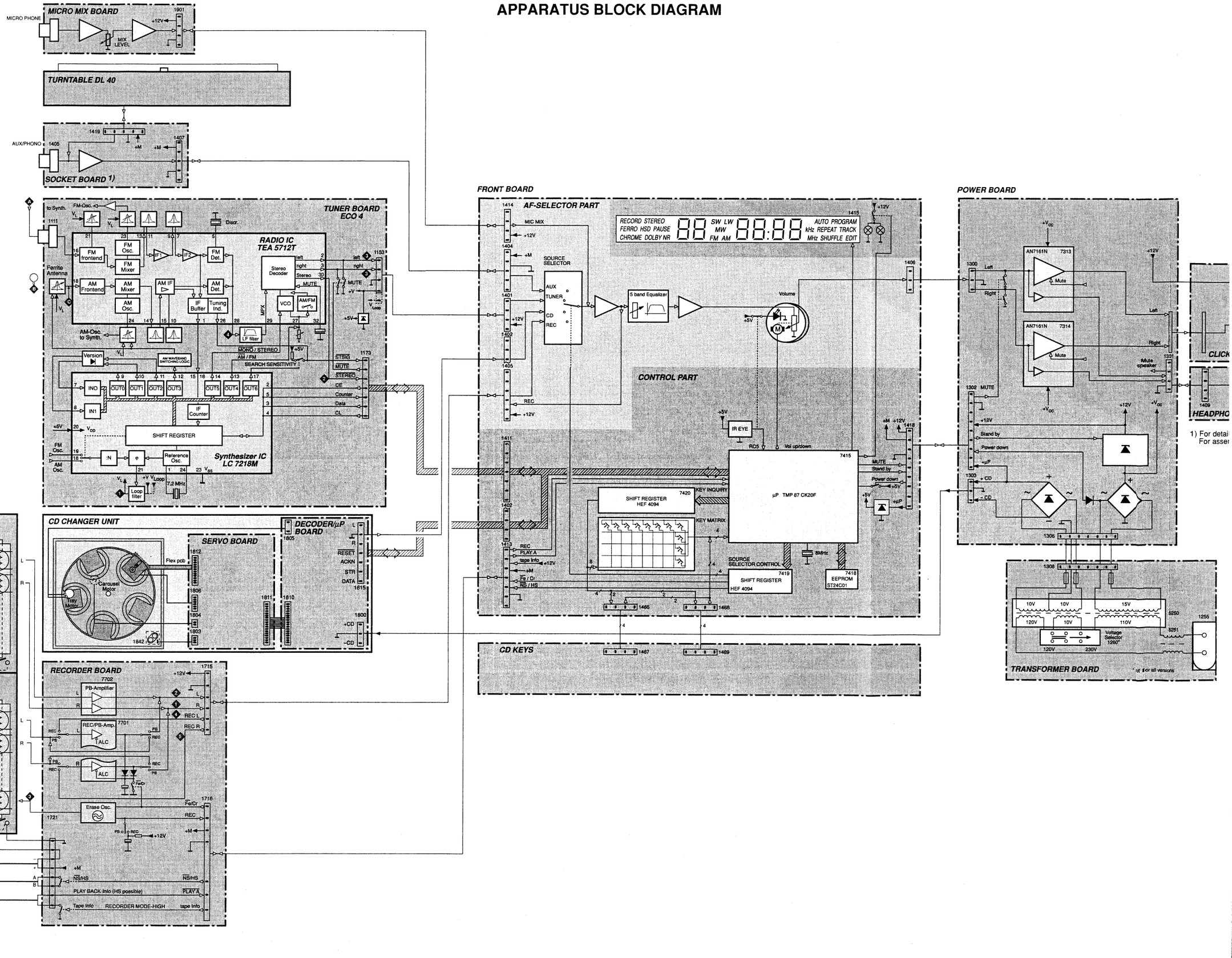
Error code shown on the display	Description
2 Err	Focus error
7 Err	Subcode error, no valid subcode
8 Err	TOC error, out of lead-in area while reading TOC
9 Err	CD4 + decoder error
10 Err	Radial error
12 Err	Fatal sledge error
13 Err	Turntable motor error
30 Err	Too many grooves to jump
31 Err	Search time out error
32 Err	Search binary error
33 Err	Search index error (index not found)
34 Err	Search time error (relative time not found)
35 Err	Carousel error
50 Err	Edit calculation error
51 Err	Wrong disc
52 Err	Insert disc

table 3

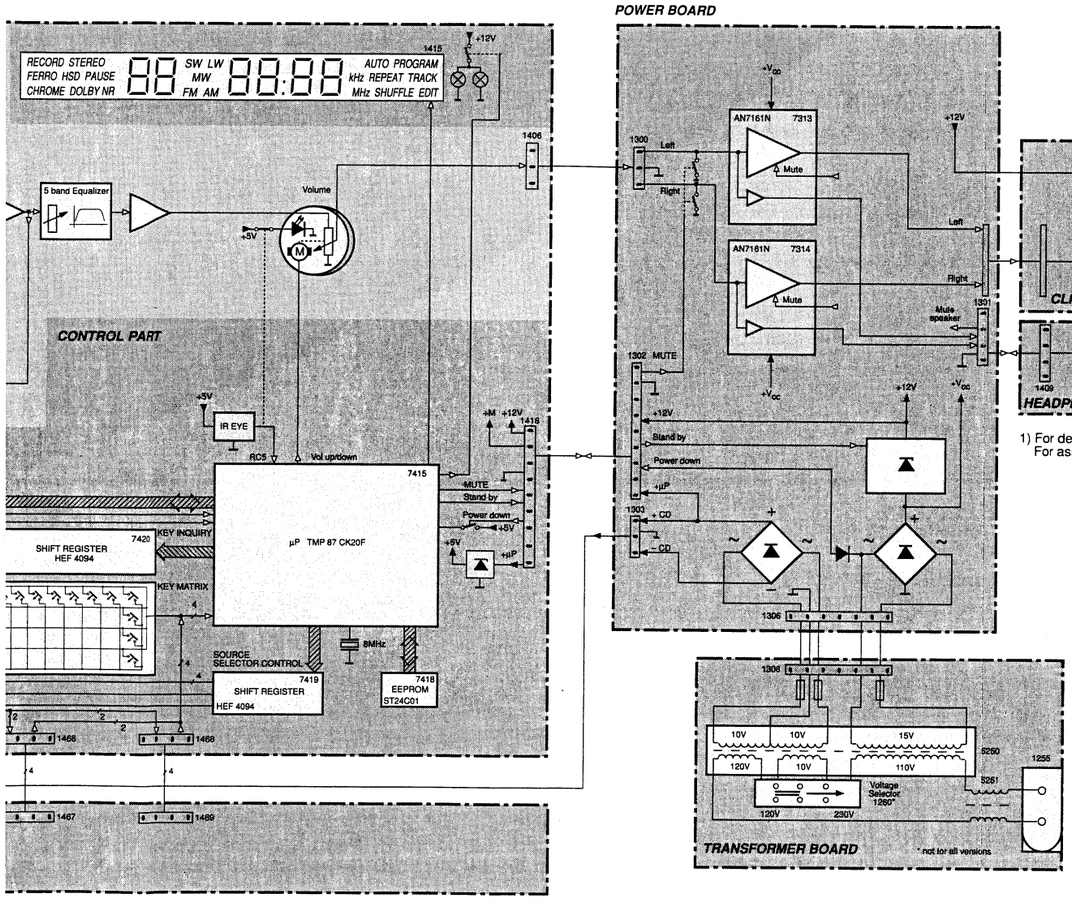
WIRING DIAGRAM



APPARATUS BLOCK DIAGRAM



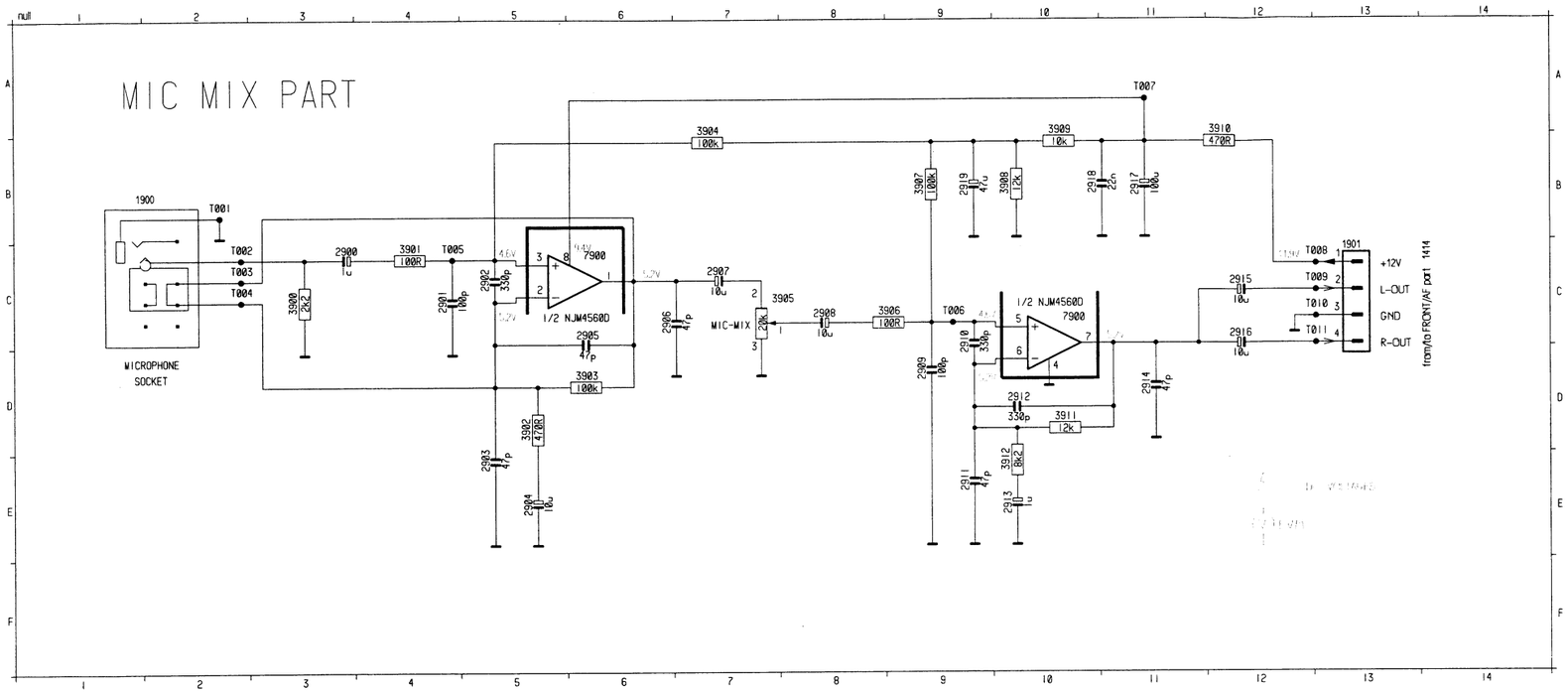
LOCK DIAGRAM



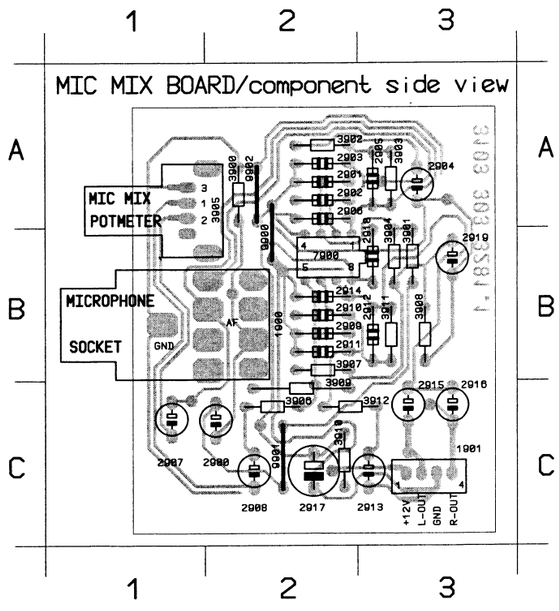
1) For detailed circuit diagram see FRONT/AF part.
For assembly drawing see FRONT BOARD.

Micro Mix not in all versions

1900 B 2 2901 C 4 2904 E 5 2907 C 7 2910 C 9 2913 E10 2916 C12 2919 B 9 3902 D 5 3905 C 7 3908 B10 3911 D10 7900 C10 T003 C 2 T006 C 9 T009 C13
1901 C13 2902 E 5 2905 C 6 2908 D 9 2911 E 9 2914 D10 2917 B11 3900 C 4 3903 D 6 3906 B 9 3909 A10 3912 E10 T001 B 2 T004 C 2 T007 A11 T010 C13
2900 C 3 2903 E 5 2906 C 6 2909 D 9 2912 D10 2915 C12 2918 B10 3901 C 4 3904 A 7 3907 B 9 3910 A12 7900 C 6 T002 C 2 T005 C 4 T008 C13 T011 C13



1900 B 1 2905 A 3 2912 B 3 2919 B 3 3906 C 2 7900 B 2
1901 C 3 2906 A 2 2913 C 3 3900 A 2 3907 B 2 9000 B 2
2900 C 2 2907 C 1 2914 B 2 3901 B 3 3908 B 3 9001 C 2
2901 A 2 2908 C 2 2915 C 3 3902 A 2 3909 C 2 9002 A 2
2902 A 2 2909 B 2 2916 C 3 3903 A 3 3910 C 2
2903 A 2 2910 B 2 2917 C 2 3904 B 3 3911 B 3
2904 A 3 2911 B 2 2918 B 3 3905 A 1 3912 C 3



valid for PCBs stage .2

0002 A 9 2454 B 13 3400 D 7 3651 H 10
0003 A 9 2455 C 11 3401 D 13 3652 I 9
0004 A 9 2456 C 12 3402 D 12 3653 H 8
0005 D 7 2460 D 3 3403 D 12 3654 I 8
1401 A 1 2461 D 3 3404 D 11 3655 I 9
1402 C 1 2462 D 4 3405 D 11 3660 I 9
1404 B 1 2463 D 3 3406 E 3 3661 I 9
1405 D 1 2464 E 3 3407 E 4 3662 C 10
1406 E 8 2465 F 8 3408 E 3 3663 C 10
1407 H 9 2466 C 13 3409 E 2 3664 E 7
1408 I 8 2467 E 1 3410 E 2 3665 F 7
1409 I 5 2468 C 1 3411 F 8 3666 F 7
1410 I 6 2469 H 9 3412 F 7 3667 C 9
1411 A 4 2470 I 9 3413 E 7 3668 B 5
1413 F 9 2471 H 8 3414 E 7 5401 B 7
1415 A 5 2472 I 8 3415 E 8 5402 B 5
1416 B 6 2473 I 9 3416 E 8 5405 E 3
1417 B 7 2475 A 2 3417 E 6 6401 D 2
1418 F 5 2476 F 12 3418 E 6 6402 C 3
1419 H 10 2477 I 10 3419 B 8 6403 D 3
1421 B 13 2502 E 5 3500 A 4 6404 C 3
1422 B 12 2503 D 5 3501 C 9 6405 D 4
1423 F 12 2504 B 6 3502 C 9 6406 C 2
1425 A 13 2505 A 11 3503 A 11 6407 D 3
1426 A 12 2507 B 12 3504 A 12 6408 C 3
1433 F 10 2508 A 3 3505 A 12 6409 D 3
1434 B 11 2509 A 3 3506 C 5 6410 C 3
1435 B 11 2510 A 4 3507 B 4 6411 D 4
1436 B 3 2512 E 5 3508 B 4 6412 C 2
1437 F 4 2513 E 5 3516 A 3 6413 D 3
1438 F 2 2514 C 4 3517 A 3 6414 C 3
1439 E 1 2552 I 9 3526 D 5 6415 D 2
1440 F 1 2553 I 9 3528 B 2 6416 C 4
1444 F 3 2554 I 5 3530 A 3 6418 B 12
1448 B 3 2555 I 5 3531 A 3 6419 B 12
1450 J 5 2556 D 13 3532 A 3 6420 F 12
1451 J 8 2557 D 13 3533 A 3 6421 F 12
1452 J 13 2558 C 12 3534 A 3 6422 C 11
1453 J 12 3401 A 1 3535 A 3 6423 C 11
1454 J 4 3402 A 1 3536 A 2 6424 C 11
1455 J 3 3403 A 1 3537 B 4 6425 C 11
1456 J 1 3404 A 1 3538 B 4 6427 A 12
1457 J 2 3405 C 1 3539 A 4 6428 C 9
1458 J 10 3406 C 1 3540 E 6 6431 F 5
1459 J 10 3407 C 1 3550 B 5 6432 E 10
1460 J 8 3408 C 1 3552 F 4 6442 D 2
1461 J 9 3409 D 2 3554 A 13 6450 C 9
1462 J 11 3410 D 2 3555 A 12 6453 F 7
1463 J 12 3413 B 1 3556 A 13 6455 D 1
1466 F 3 3414 B 1 3557 A 13 6456 E 1
1467 J 7 3415 I 9 3558 B 11 7403 C 12
1468 F 12 3416 I 8 3559 B 11 7406 F 8
1469 J 7 3417 D 3 3560 B 11 7407 E 2
2401 A 2 3418 C 3 3562 D 5 7408 F 8
2402 A 2 3419 D 4 3563 D 5 7409 F 7
2403 D 3 3420 C 2 3564 A 11 7410 F 7
2404 B 2 3421 D 3 3565 A 2 7411 F 7
2405 D 4 3422 C 3 3568 B 9 7412 F 6
2406 B 2 3423 D 2 3572 A 11 7413 F 8
2407 D 2 3424 C 3 3573 F 9 7418 C 4
2408 B 2 3425 D 4 3574 F 9 7419 E 4
2409 C 2 3426 C 4 3575 G 9 7420 B 11
2410 B 3 3427 F 2 3576 F 11 7421 D 5
2411 C 3 3428 E 3 3577 E 9 7422 B 1
2412 B 2 3431 F 2 3578 F 9 7423 D 9
2413 C 4 3432 F 3 3579 F 10 7424 D 9
2414 B 2 3435 E 2 3580 E 10 7425 E 5
2415 C 3 3436 E 3 3581 E 10 7426 A 11
2416 B 3 3437 D 2 3582 E 9 7427 D 5
2417 C 4 3438 D 2 3583 E 10 7432 D 9
2418 B 3 3439 D 12 3585 B 4 7433 E 10
2419 F 2 3440 D 12 3586 C 5 7440 E 9
2420 E 3 3441 C 13 3587 F 5 7441 E 9
2421 E 2 3442 D 13 3589 B 11 7445 C 2
2422 F 3 3443 D 13 3590 D 4 7446 C 2
2423 B 2 3444 D 13 3591 B 11 7447 I 9
2424 B 4 3445 D 12 3592 D 4 7448 I 9
2425 F 2 3446 D 13 3593 B 11 8400 D 7
2426 F 3 3447 D 12 3594 B 5
2427 E 2 3448 D 12 3595 B 5
2428 E 3 3449 D 11 3596 B 5
2429 E 13 3450 D 11 3597 B 5
2430 E 13 3451 D 11 3598 A 2
2431 E 12 3452 D 11 3601 E 2
2432 E 13 3455 E 10 3602 F 3
2433 D 12 3456 E 11 3603 F 2
2434 D 13 3457 E 11 3604 F 3
2435 E 12 3458 E 11 3605 C 1
2436 E 12 3459 E 12 3606 C 1
2437 D 12 3460 E 12 3607 C 2
2438 D 12 3461 E 12 3608 C 2
2439 E 11 3462 E 13 3609 D 2
2440 E 11 3463 C 11 3610 D 10
2441 D 11 3464 D 12 3612 B 5
2442 D 11 3465 C 12 3613 C 7
2443 E 10 3466 C 12 3615 A 2
2444 E 11 3469 C 12 3616 E 7
2445 D 11 3470 C 12 3617 G 7
2446 D 10 3471 E 13 3618 F 6
2447 C 4 3472 E 13 3621 E 1
2448 C 4 3473 C 13 3622 D 1
2449 C 13 3474 D 13 3623 E 2
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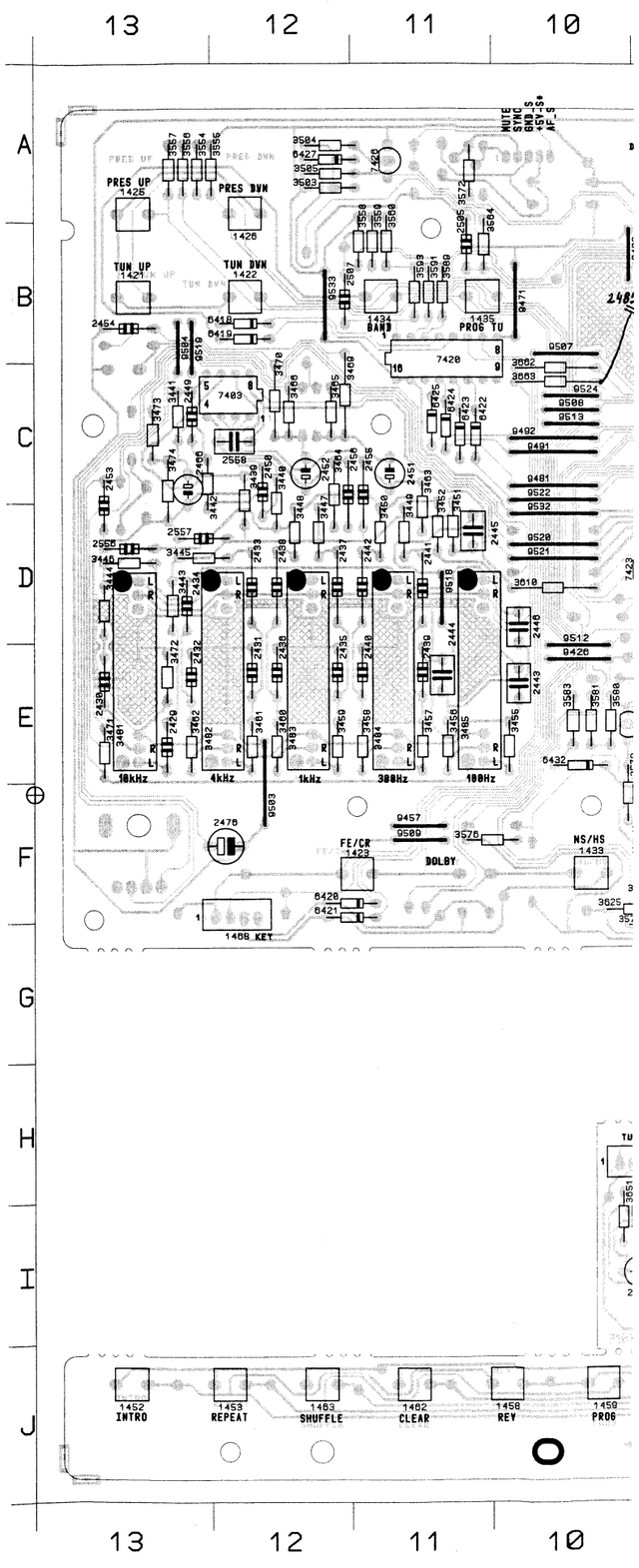
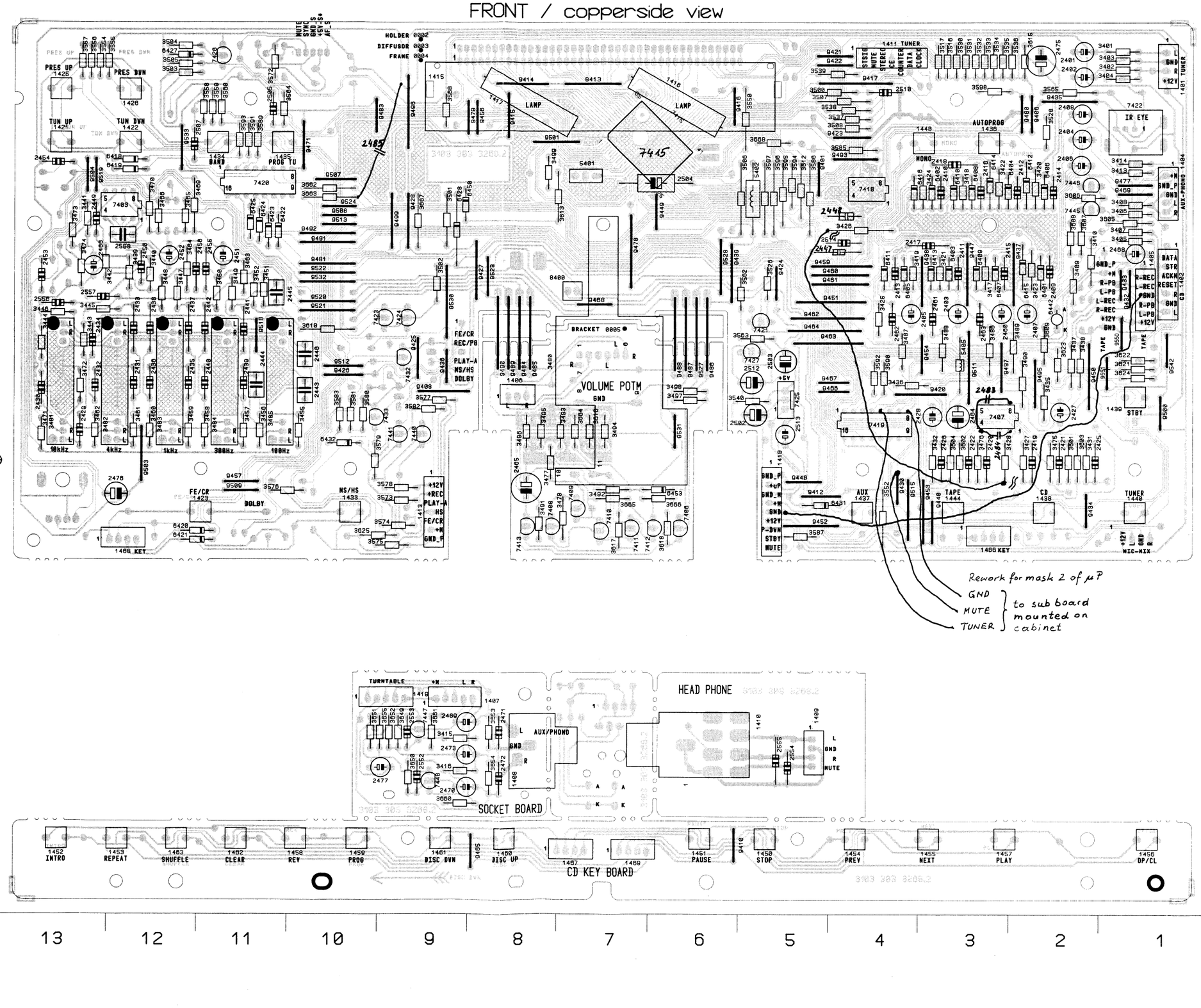
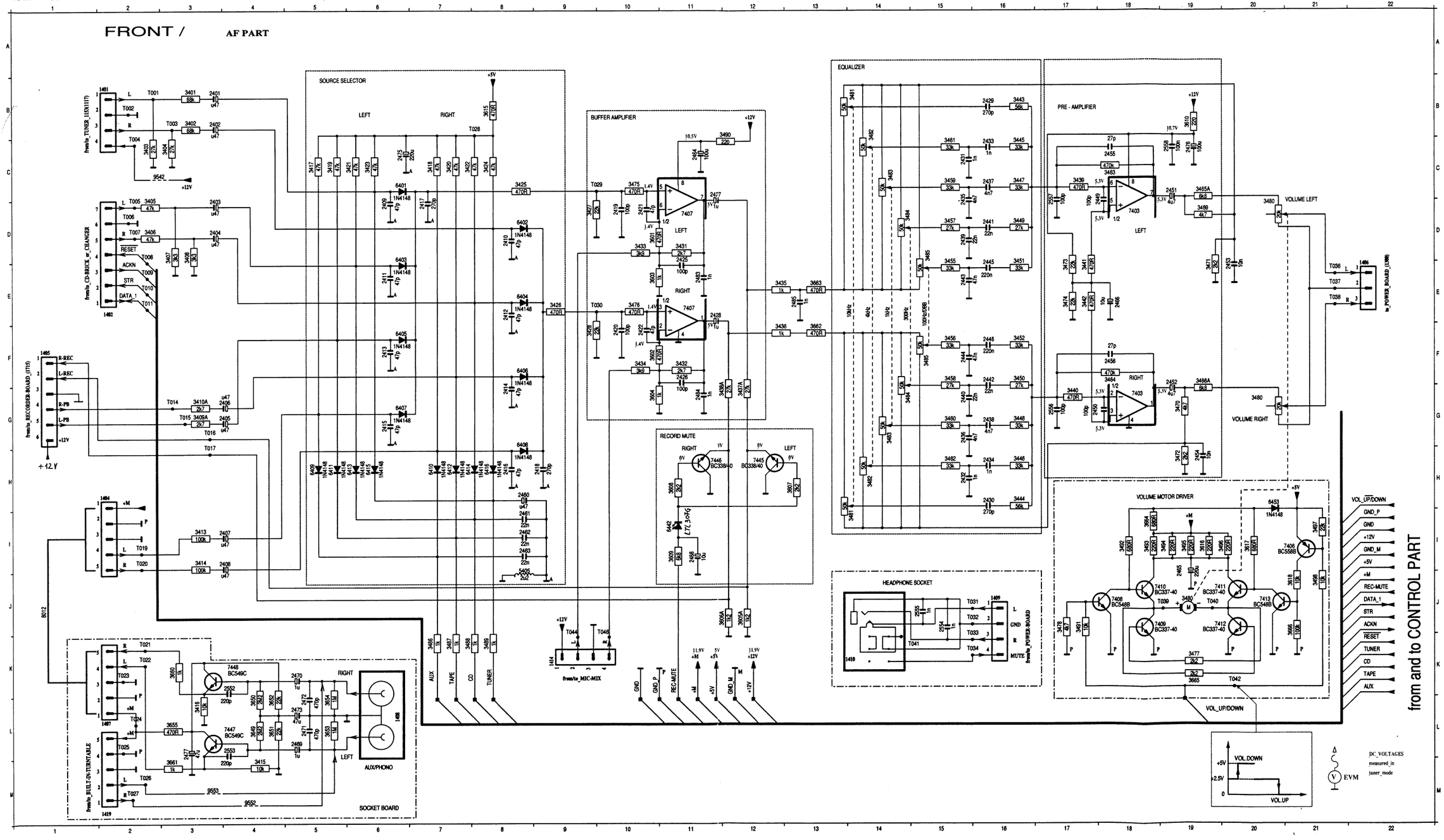
2452 C 12 3477 F 8 3649 H 9
2453 D 13 3478 F 7 3650 I 9



valid for PCBs stage .2

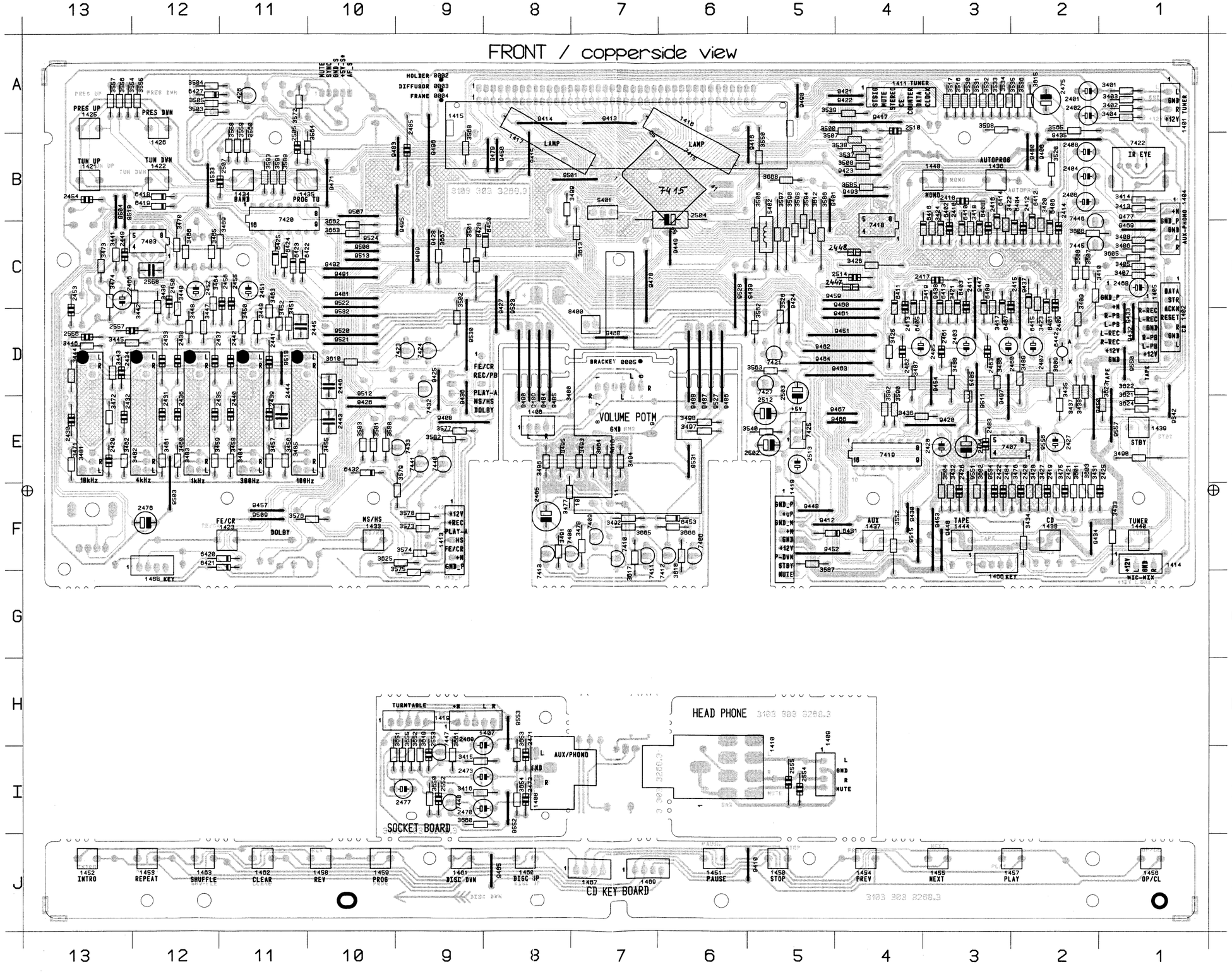
0002	A	9	2454	B	13	3400	D	7	3651	H	10
0003	A	9	2455	C	11	3401	D	13	3652	I	9
0004	A	9	2456	C	12	3402	D	12	3653	H	8
0005	D	7	2458	D	3	3403	D	12	3654	I	8
1401	A	1	2461	D	3	3404	D	11	3655	I	9
1402	C	1	2462	D	4	3405	D	11	3656	I	9
1404	B	1	2463	D	3	3406	E	3	3661	I	9
1405	D	1	2464	E	3	3407	E	4	3662	C	10
1406	E	8	2465	F	8	3408	E	3	3663	C	10
1407	H	9	2466	C	13	3409	E	2	3664	E	7
1408	I	8	2467	E	1	3410	E	2	3665	F	7
1409	I	5	2468	C	1	3411	F	8	3666	F	7
1410	I	6	2469	H	9	3412	F	7	3667	C	9
1411	A	4	2470	I	9	3413	E	7	3668	B	5
1413	F	9	2471	H	8	3414	E	7	5401	B	7
1415	A	5	2472	I	8	3415	E	8	5402	B	5
1416	B	6	2473	I	9	3416	E	8	5405	E	3
1417	B	7	2475	A	2	3417	E	6	6401	D	2
1418	F	5	2476	F	12	3418	E	6	6402	C	3
1419	H	10	2477	I	10	3419	B	8	6403	D	3
1421	B	13	2502	E	5	3500	A	4	6404	C	3
1422	B	12	2503	D	5	3501	C	9	6405	D	4
1423	F	12	2504	B	8	3502	C	9	6406	C	2
1425	A	13	2505	A	11	3503	A	11	6407	D	3
1426	A	12	2507	B	12	3504	A	12	6408	C	3
1433	F	10	2508	A	3	3505	A	12	6409	D	3
1434	B	11	2509	A	3	3506	C	5	6410	C	3
1435	B	11	2510	A	4	3507	B	4	6411	D	4
1436	B	3	2512	E	5	3508	B	4	6412	C	2
1437	F	4	2513	E	5	3516	A	3	6413	D	3
1438	F	2	2514	C	4	3517	A	3	6414	C	3
1439	E	1	2552	I	9	3526	D	5	6415	D	2
1440	F	1	2553	I	9	3528	B	2	6416	C	4
1444	F	3	2554	I	5	3530	A	3	6418	B	12
1448	B	3	2555	I	5	3531	A	3	6419	B	12
1450	J	5	2556	D	13	3532	A	3	6420	F	12
1451	J	6	2557	D	13	3533	A	3	6421	F	12
1452	J	13	2558	C	12	3534	A	3	6422	C	11
1453	J	12	3401	A	1	3535	A	3	6423	C	11
1454	J	4	3402	A	1	3536	A	2	6424	C	11
1455	J	3	3403	A	1	3537	B	4	6425	C	11
1456	J	1	3404	A	1	3538	B	4	6427	A	12
1457	J	2	3405	C	1	3539	A	4	6428	C	9
1458	J	10	3406	C	1	3540	E	6	6431	F	5
1459	J	10	3407	C	1	3550	B	5	6432	E	10
1460	J	8	3408	C	1	3552	F	4	6442	D	2
1461	J	9	3409	D	2	3554	A	13	6450	C	9
1462	J	11	3410	D	2	3555	A	12	6453	F	7
1463	J	12	3413	B	1	3556	A	13	6455	D	1
1466	F	3	3414	B	1	3557	A	13	6456	E	1
1467	J	7	3415	I	9	3558	B	11	7403	C	12
1468	F	12	3416	I	8	3559	B	11	7406	F	6
1469	J	7	3417	D	3	3560	B	11	7407	E	2
2401	A	2	3418	C	3	3562	D	5	7408	F	8
2402	A	2	3419	D	4	3563	D	5	7409	F	7
2403	D	3	3420	C	2	3564	A	11	7410	F	7
2404	B	2	3421	D	3	3565	A	2	7411	F	7
2405	D	4	3422	C	3	3568	B	9	7412	F	6
2406	B	2	3423	D	2	3572	A	11	7418	C	4
2407	D	2	3424	C	3	3573	F	9	7419	C	4
2408	B	2	3425	D	4	3574	F	9	7419	E	4
2409	C	2	3426	C	4	3575	G	9	7420	B	11
2410	B	3	3427	F	2	3576	F	11	7421	D	5
2411	C	3	3428	E	3	3577	E	9	7422	B	1
2412	B	2	3431	F	2	3578	F	9	7423	D	9
2413	C	4	3432	F	3	3579	F	10	7424	D	9
2414	B	2	3435	E	2	3580	E	10	7425	E	5
2415	C	3	3436	E	3	3581	E	10	7426	A	11
2416	B	3	3437	D	2	3582	E	9	7427	D	5
2417	C	4	3438	D	2	3583	E	10	7432	D	9
2418	B	3	3439	D	12	3585	B	4	7433	E	10
2419	F	2	3440	D	12	3586	C	5	7440	E	9
2420	E	3	3441	C	13	3587	F	5	7441	E	9
2421	E	2	3442	D	13	3588	B	11	7445	C	2
2422	F	3	3443	D	13	3590	D	4	7446	C	2
2423	B	2	3444	D	13	3591	B	11	7447	I	9
2424	B	4	3445	D	12	3592	D	4	7448	I	9
2425	F	2	3446	D	13	3593	B	11	8400	D	7
2426	F	3	3447	D	12	3594	B	5			
2427	E	2	3448	D	12	3595	B	5			
2428	E	3	3449	D	11	3596	B	5			
2429	E	13	3450	D	11	3597	B	5			
2430	E	13	3451	D	11	3598	A	2			
2431	E	12	3452	D	11	3601	E	2			
2432	E	13	3455	E	10	3602	F	3			
2433	D	12	3456	E	11	3603	F	2			
2434	D	13	3457	E	11	3604	F	3			
2435	E	12	3458	E	11	3605	C	1			
2436	E	12	3459	E	12	3606	C	1			
2437	D	12	3460	E	12	3607	C	2			
2438	D	12	3461	E	12	3608	C	2			
2439	E	11	3462	E	13	3609	D	2			
2440	E	11	3463	C	11	3610	D	10			
2441	D	11	3464	D	12	3612	B	5			
2442	D	11	3465	C	12	3613	C	7			
2443	E	10	3466	C	12	3615	A	2			
2444	E	11	3469	C	12	3616	E	7			
2445	D	11	3470	C	12	3617	G	7			
2446	D	10	3471	E	13	3618	F	8			
2447	C	4	3472	E	13	3621	E	1			
2448	C	4	3473	C	13	3622	D	1			
2449	C	13	3474	D	13	3623	E	2			
2450	C	12	3475	F	2	3624	E	1			
2451	C	11	3476	E	3	3625	F	10			
2452	C	12	3477	F	8	3648	H	9			
2453	D	13	3478	F	7	3650	I	9			



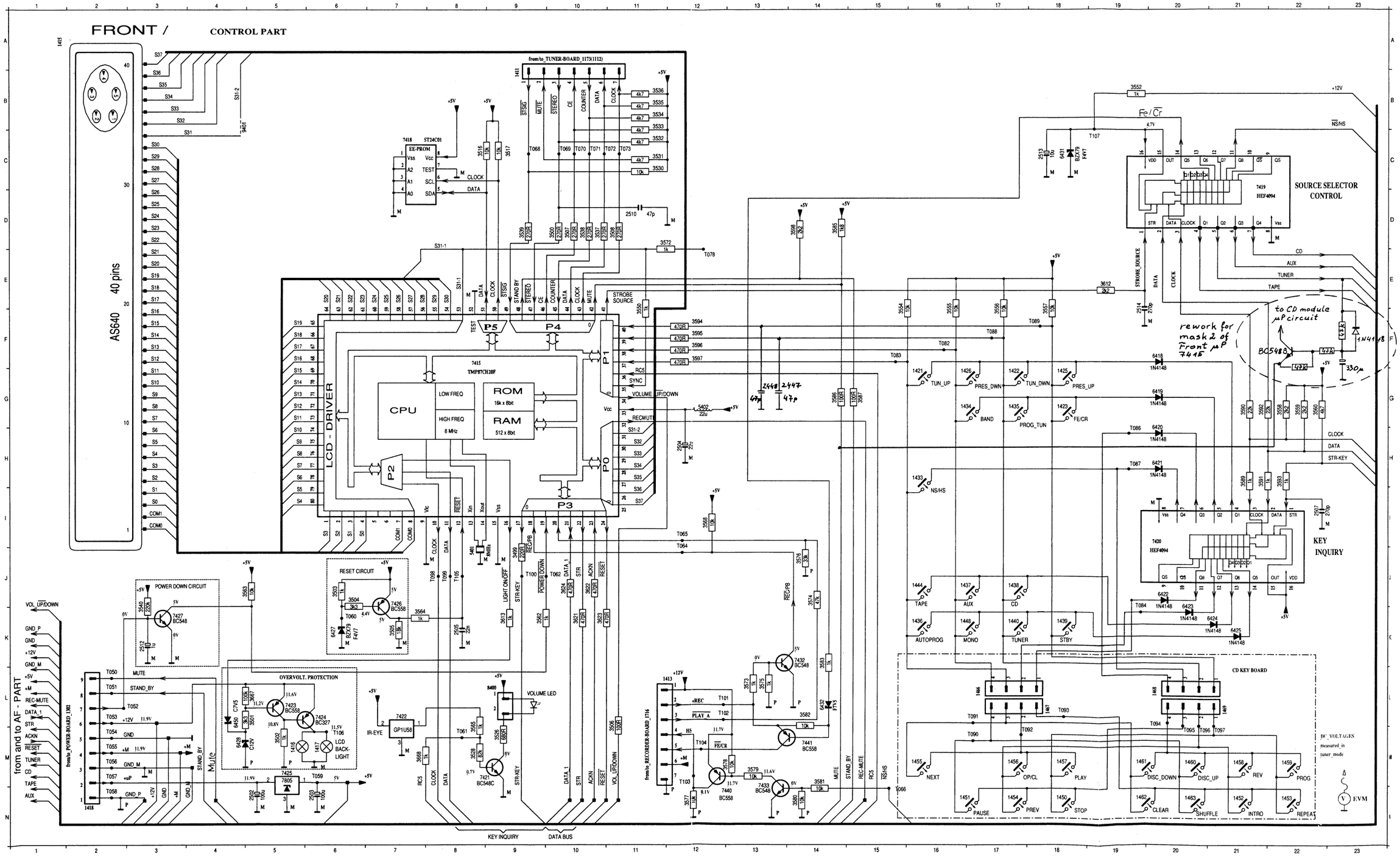


'alid for sets with PCBs stage .3

0002	A	9	2400	D	3	3401	D	13	3652	I	9
0003	A	9	2401	D	3	3402	D	12	3653	H	8
0004	A	9	2402	D	4	3403	D	12	3654	I	8
0005	D	7	2403	D	3	3404	D	11	3655	I	9
1401	A	1	2404	E	3	3405	D	11	3600	I	9
1402	C	1	2405	F	8	3406	E	3	3601	I	9
1404	B	1	2406	C	13	3407	E	4	3602	C	10
1405	D	1	2408	C	1	3408	E	3	3603	C	10
1406	E	8	2409	H	9	3409	E	2	3604	E	7
1407	H	9	2470	I	9	3490	E	1	3605	F	7
1408	I	8	2471	H	8	3491	F	8	3606	F	7
1409	I	5	2472	I	8	3492	F	7	3607	C	9
1410	I	6	2473	I	9	3493	E	7	3608	B	5
1411	A	4	2475	A	2	3494	E	7	5401	B	7
1413	F	9	2476	F	12	3495	E	8	5402	B	5
1414	F	1	2477	I	10	3496	E	8	5405	E	3
1415	A	5	2483	E	3	3497	E	6	6401	D	2
1416	B	6	2484	F	3	3498	E	6	6402	C	3
1417	B	7	2485	A	9	3499	B	8	6403	D	3
1418	F	5	2502	E	5	3500	A	4	6404	C	3
1419	H	10	2503	D	5	3501	C	9	6405	D	4
1421	B	13	2504	B	6	3502	C	9	6406	C	2
1422	B	12	2505	A	11	3503	A	11	6407	D	3
1423	F	12	2507	B	12	3504	A	12	6408	C	3
1425	A	13	2510	A	4	3505	A	12	6409	D	3
1426	A	12	2512	E	5	3506	C	5	6410	C	3
1433	F	10	2513	E	5	3507	B	4	6411	D	4
1434	B	11	2514	C	4	3508	B	4	6412	C	2
1435	B	11	2552	I	9	3516	A	3	6413	D	3
1436	B	3	2553	I	9	3517	A	3	6414	C	3
1437	F	4	2554	I	5	3526	D	5	6415	D	2
1438	F	2	2555	I	5	3528	B	2	6416	C	4
1439	E	1	2556	D	13	3530	A	3	6418	B	12
1440	F	1	2557	D	13	3531	A	3	6419	B	12
1444	F	3	2558	C	12	3532	A	3	6420	F	12
1448	B	3	3401	A	1	3533	A	3	6421	F	12
1450	J	5	3402	A	1	3534	A	3	6422	C	11
1451	J	6	3403	A	1	3535	A	3	6423	C	11
1452	J	13	3404	A	1	3536	A	2	6424	C	11
1453	J	12	3405	C	1	3537	B	4	6425	C	11
1454	J	4	3406	C	1	3538	B	4	6427	A	12
1455	J	3	3407	C	1	3539	A	4	6428	C	9
1456	J	1	3408	C	1	3540	E	9	6431	F	5
1457	J	2	3409	D	2	3550	B	5	6432	E	10
1458	J	10	3410	D	2	3552	F	4	6442	D	2
1459	J	10	3413	B	1	3554	A	13	6450	C	9
1460	J	8	3414	B	1	3555	A	12	6453	F	7
1461	J	9	3415	I	9	3556	A	13	7403	C	12
1462	J	11	3416	I	8	3557	A	13	7406	F	6
1463	J	12	3417	D	3	3558	B	11	7407	E	2
1466	F	3	3418	C	3	3559	B	11	7408	F	8
1467	J	7	3419	D	4	3560	B	11	7409	F	7
1468	F	12	3420	C	2	3562	D	5	7410	F	7
1469	J	7	3421	D	3	3563	D	5	7411	F	7
2401	A	2	3422	C	3	3564	A	11	7412	F	6
2402	A	2	3423	D	2	3565	A	2	7413	F	8
2403	D	3	3424	C	3	3568	B	9	7418	C	4
2404	B	2	3425	D	4	3572	A	11	7419	E	4
2405	D	4	3426	C	4	3573	F	9	7420	B	11
2406	B	2	3427	F	2	3574	F	9	7421	D	5
2407	D	2	3428	F	2	3575	G	9	7422	B	1
2408	B	2	3431	F	2	3576	F	11	7423	D	9
2409	C	2	3432	F	3	3577	E	9	7424	D	9
2410	B	3	3433	F	1	3578	F	9	7425	E	5
2411	C	3	3434	F	2	3579	F	10	7426	A	11
2412	B	2	3435	E	2	3580	E	10	7427	D	5
2413	C	4	3436	E	3	3581	E	10	7432	D	9
2414	B	2	3437	D	2	3582	E	9	7433	E	10
2415	C	3	3438	D	2	3583	E	10	7440	E	9
2416	B	3	3439	D	12	3585	D	4	7441	E	9
2417	C	4	3440	D	12	3586	C	5	7445	C	2
2418	B	3	3441	C	13	3587	F	5	7446	C	2
2419	F	2	3442	D	13	3589	B	11	7447	I	9
2420	F	2	3443	D	13	3590	D	4	7448	I	9
2421	E	2	3444	D	13	3591	B	11			
2422	E	3	3445	D	12	3592	D	4			
2425	F	2	3446	D	13	3593	B	11			
2426	F	3	3447	D	12	3594	B	5			
2427	E	2	3448	D	12	3595	B	5			
2428	E	3	3449	D	11	3596	B	5			
2429	E	13	3450	D	11	3597	B	5			
2430	E	13	3451	D	11	3598	A	2			
2431	E	12	3452	D	11	3601	E	2			
2432	E	13	3455	E	10	3602	F	3			
2433	D	12	3456	E	11	3603	F	2			
2434	D	13	3457	E	11	3604	E	3			
2435	E	12	3458	E	11	3605	C	1			
2436	E	12	3459	E	12	3606	C	1			
2437	D	12	3460	E	12	3607	C	2			
2438	D	12	3461	E	12	3608	C	2			
2439	E	11	3462	E	13	3609	E	2			
2440	E	11	3463	C	11	3610	D	10			
2441	D	11	3464	D	12	3612	B	5			
2442	D	11	3465	C	12	3613	C	7			
2443	E	10	3466	C	12	3615	A	2			
2444	E	11	3469	C	12	3616	E	7			
2445	D	11	3470	C	12	3617	G	7			
2446	D	10	3471	E	13	3618	F	6			
2449	C	13	3472	E	13	3621	E	1			
2450	C	12	3473	C	13	3622	D	1			
2451	C	11	3474	D	13	3623	E	2			
2452	C	12	3475	F	2	3624	E	1			
2453	D	13	3476	E	3	3625	F	10			
2454	B	13	3477	F	8	3649	H	9			
2455	C	11	3478	F	7	3650	I	9			
2456	C	12	3480	D	7	3651	H	10			



CS 51 683



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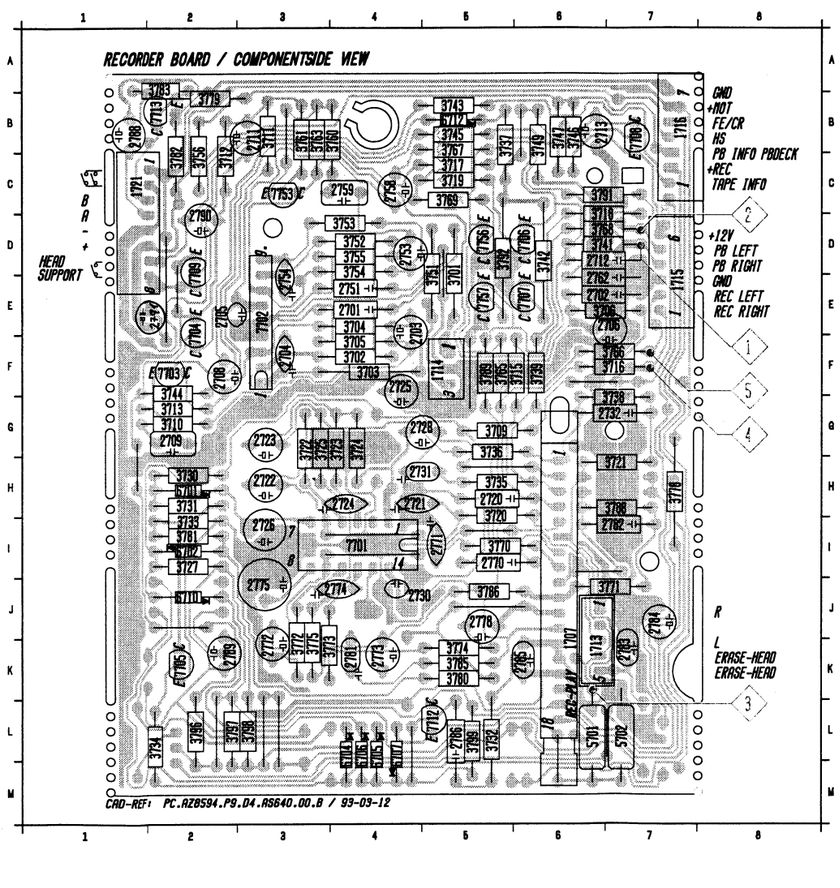


1707 J6	3711 B3	3783 A2	
1713 K6	3712 C2	3785 K5	
1714 F5	3713 G2	3786 J5	
1715 E7	3715 F6	3788 H7	
1716 B7	3716 F7	3789 F5	
1721 C1	3717 C5	3791 C6	
2701 E4	3718 D6	3792 D5	
2702 E6	3719 C5	3796 L2	
2703 E4	3720 H5	3797 L2	
2704 F3	3721 H7	3798 L3	
2705 E2	3722 G3	3799 L5	
2706 E7	3723 G4	5701 L6	
2708 F2	3724 G4	5702 L7	
2709 G2	3725 G3	6701 H2	
2711 B3	3727 I2	6702 I2	
2712 D6	3730 H2	6704 L4	
2713 B6	3731 H2	6705 L4	
2720 H5	3732 L5	6706 L4	
2721 H4	3733 I2	6707 L4	
2722 H3	3734 L2	6710 J2	
2723 G3	3735 H5	6712 B5	
2724 H4	3736 G5	7701 I4	
2725 F4	3737 B5	7702 E3	
2726 I3	3738 G7	7703 F2	
2728 G5	3739 F6	7704 E2	
2730 J4	3741 D6	7705 K2	
2731 H5	3742 D6	7706 D6	
2732 G7	3743 B5	7707 E6	
2751 E4	3744 F2	7708 B7	
2753 D4	3745 B5	7709 D2	
2754 E3	3746 B6	7712 L5	
2758 C4	3747 B6	7713 B2	
2759 C4	3749 B6	7753 C3	
2762 E6	3751 D5	7756 D5	
2770 I5	3752 D4	7757 E5	
2771 I5	3753 D4	9701 L7	
2772 K3	3754 D4	9702 L6	
2773 K4	3755 D4	9705 L4	
2774 J4	3756 C2	9706 J2	
2775 J3	3760 B4	9707 H1	
2778 J5	3761 B3	9708 D5	
2781 K4	3763 B3	9709 E2	
2782 I7	3765 F5	9711 J5	
2783 K7	3766 F7	9712 I6	
2784 J7	3767 B5	9713 I5	
2785 K6	3768 D6	9714 I4	
2786 L5	3769 C5	9715 I4	
2788 B1	3770 I5	9716 H5	
2789 K2	3771 J7	9717 B3	
2790 D2	3772 K3	9722 F5	
3701 D5	3773 K3	9723 F6	
3702 F4	3774 K5	9727 L3	
3703 F4	3775 K3	9731 E2	
3704 E4	3778 H7	9732 L2	
3705 F4	3779 B2	9733 L3	
3706 E6	3780 K5	9741 B6	
3709 G5	3781 I2	2391 E4	
3710 G2	3782 C2		

RECORDER ADJUSTMENT TABLE

Adjustment	Cassette/Source	Recorde mode	Measure on	Read on	Adjust with	Adjust to
Azimuth [1]	SBC 420 8kHz	PLAY A-Deck PLAY B-Deck	◇1 ◇2 or Phone socket	mV - meter	left-hand screw	maximum output left = right
Motor speed [2]						
Normal speed	SBC 420 3150Hz	PLAY A + B-Deck HS-Dubbing	◇1 ◇2 or Phone socket	Wow and Flutter meter or Counter	pot on motor	0±1%
High speed [4]				Counter	check only	5556-5783Hz

CHECK ONLY

Check	Cassette/Source	Recorder mode	Measure on	Read on	Check if
Wow and Flutter	SBC 420 3150Hz	PLAY A or B-Deck	◇1 ◇2	Wow and Flutter meter	≤ 0,3% weighted
		PLAY A and B-Deck	or Phone socket		≤ 0,35% weighted
Erase Oscillator					
Voltage	any	REC A-deck	◇3 Erase head	mV - meter	Cr ≥ 9,8Vrms Fe ≥ 20,8 Vrms
Frequency				Counter	f = 60kHz ± 5kHz
Playback level [3]	SBC420 315Hz 0dB level	PLAY A-Deck[5]	◇1 ◇2	mV - meter	41 mV - 57 mV
		PLAY B-Deck[5]			41 mV - 57 mV
Fequency reponse Playback	SBC420	PLAY A or B-Deck[5]	◇1 ◇2	mV - meter	125 Hz - 10 kHz within 8dB
Overall	Level = 0,5mV ◇4 ◇5	REC A-Deck[5] PLAY A-Deck[5]	◇1 ◇2	mV - meter	125 Hz - 10 kHz within 8dB 125 Hz - 8 kHz dubbing
Distortion	SBC 420 Level = 10mV ◇4 ◇5	REC A-Deck[5] PLAY A-Deck[5]	◇1 ◇2	mV - meter	50 mV ± 10 mV, D ≤ 5%

SBC 420 Service code: 4822 397 30071

1) For Azimuth adjustment set need not to be dismantled. Remove ornamental part of cassette door and put screwdriver (torx5) through holes of cassette door.
2) Absolute difference between deck A and deck B have to be ≤2%.
3) Noise level in "PAUSE" should be 80 - 180µV (A-weighted).
4) Insert SBC420 in A-Deck and use High speed dubbing mode to check frequency.
5) Recorder has to be in Fe- Mode

RECORDER BOARD

RIGHT CHANNELS

LEFT CHANNELS

ERASE OSCILLATOR

ALC LEVEL SWITCH

DECK A

DECK B

MUTE DECK A right

MUTE DECK B right

MUTE DECK A left

MUTE DECK B left

HS = H

REC RIGHT

REC LEFT

GND

RIGHT OUT PB

LEFT OUT PB

+12V

TAPE INFO

+REC

PB INFO

HIGH SPEED

FE/CR*

+MOT

GND MOT

TAPE MODE = H

HIGHSPEED POSSIBLE = L

HIGHSPEED = H

Chrome = H

* only for AS640

NS/HS switch

TAPE DECKS

MOTOR CONTROL

HEAD SUPPORT INDICATION

PB-DECK B

ERASE HEAD

CONTROL PART 1413

AF PART 1405

TO FRONT BOARD

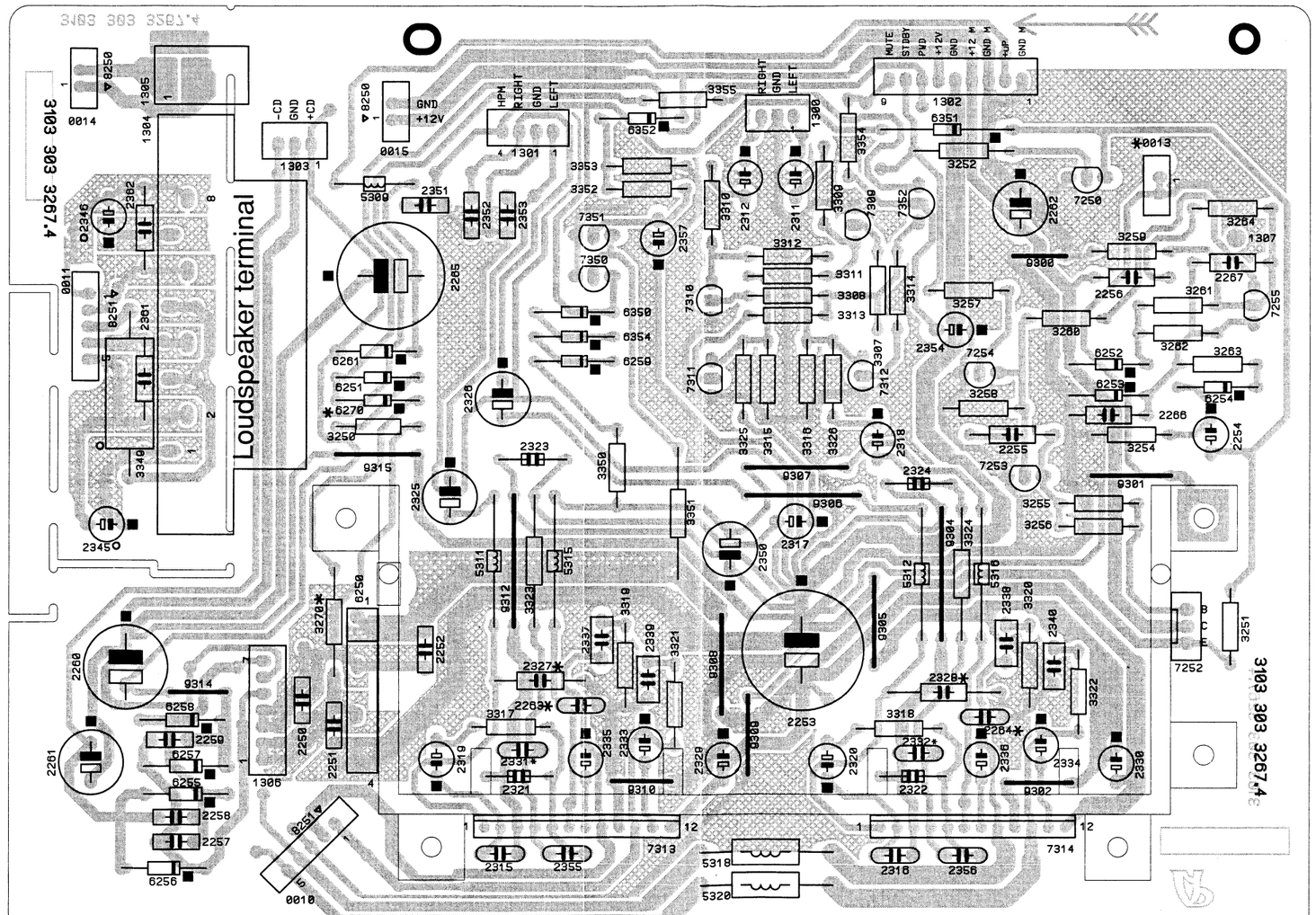
DC VOLTAGES
EVM
V PB-mode
( ) REC-mode

* NOT USED COMPONENTS

o FOR SURROUND ONLY

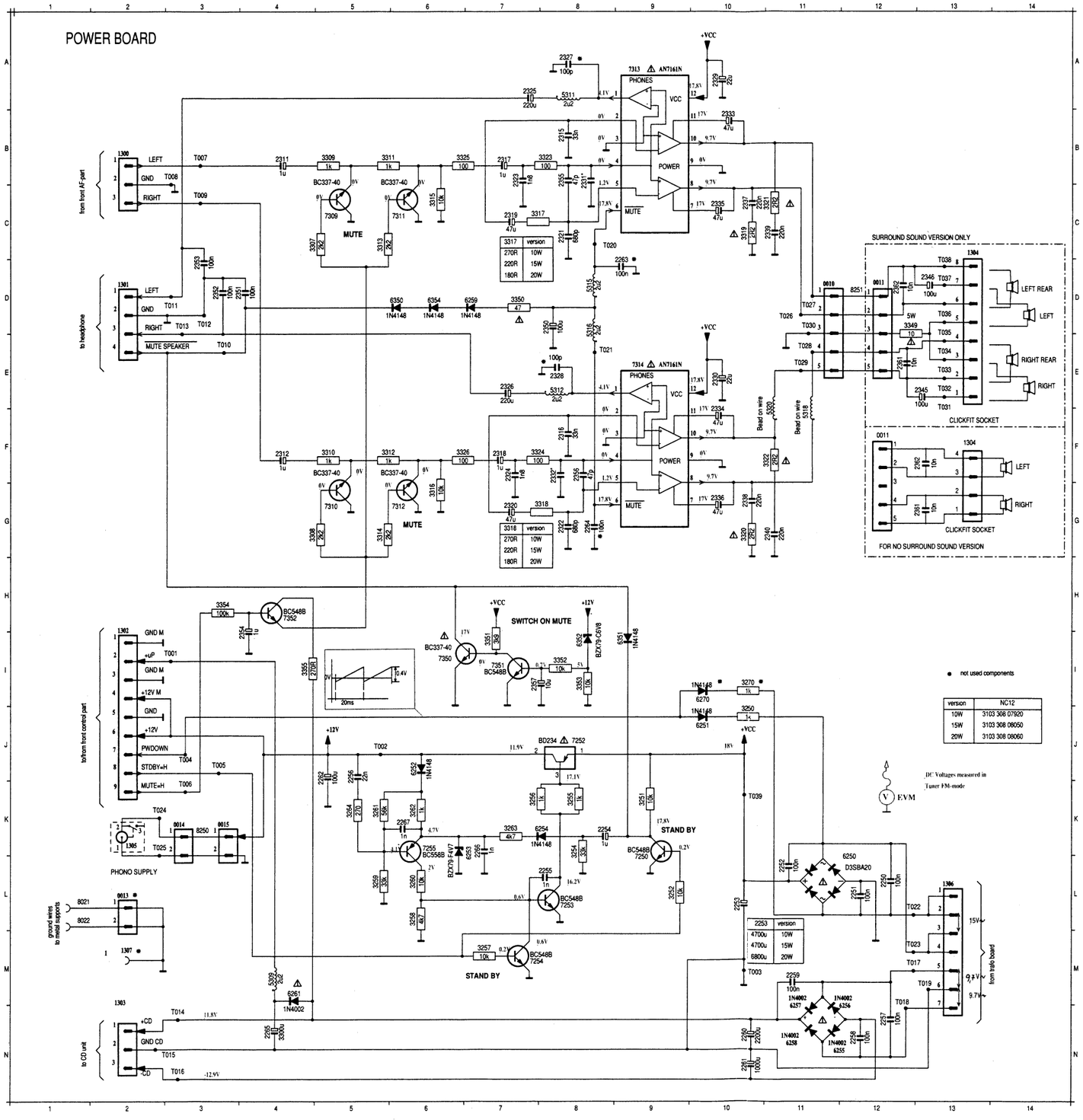
E B C FOR ALL TRANSISTORS

POWER BOARD / Component side view



	9304 B 2	7310 D 4	6270 C 6	6250 B 6	3352 E 4	3319 B 4	3308 D 3	3256 C 1	2354 D 2	2336 A 2	2325 C 5	2312 E 3	2258 A 7	1305 E 7
	9302 A 2	7309 D 3	6261 D 6	5320 A 3	3351 C 4	3318 A 3	3307 D 3	3255 C 1	2353 E 5	2335 A 4	2324 C 2	2311 E 3	2257 A 7	1304 D 7
9315 C 6	9301 C 1	7255 D 1	6259 D 5	5318 A 3	3350 C 4	3317 A 5	3270 B 6	3254 C 1	2352 E 5	2334 A 2	2323 C 5	2267 D 1	2256 D 1	1303 E 6
9314 B 7	9300 D 2	7254 D 2	6258 A 7	5316 B 2	3349 C 7	3316 D 3	3264 E 1	3252 E 2	2351 E 5	2333 A 4	2322 A 2	2266 C 1	2255 C 2	1302 E 2
9312 B 5	7352 E 2	7253 C 2	6257 A 7	5315 B 5	3326 D 3	3315 D 3	3263 D 1	3251 B 1	2350 C 4	2332* A 2	2321 A 5	2265 D 6	2254 C 1	1301 E 5
9310 A 4	7351 D 4	7252 B 1	6256 A 7	5312 B 2	3325 D 3	3314 D 3	3262 D 1	3250 C 6	2346 E 7	2331* A 5	2320 A 3	2264 A 2	2253 B 3	1300 E 3
9309 A 3	7350 D 4	7250 E 1	6255 A 7	5311 B 5	3324 B 2	3313 D 3	3261 D 1	2362 D 7	2345 C 7	2330 A 1	2319 A 5	2263 B 4	2252 B 5	0015 E 6
9308 B 4	7314 A 2	6354 D 5	6254 D 1	5309 E 6	3323 B 5	3312 D 3	3260 D 2	2361 D 7	2340 B 2	2329 A 4	2318 C 3	2262 E 2	2251 A 6	0014 E 7
9307 C 3	7313 A 5	6352 E 4	6253 C 1	3355 E 4	3322 B 1	3311 D 3	3259 D 1	2357 D 4	2339 B 4	2328 B 2	2317 C 3	2261 A 7	2250 B 6	0013 E 1
9306 C 3	7312 D 3	6351 E 2	6252 D 1	3354 E 3	3321 B 4	3310 E 4	3258 C 2	2356 A 2	2338 B 2	2327 B 5	2316 A 3	2260 B 7	1307 E 1	0011 D 7
9305 B 3	7311 D 4	6350 D 5	6251 D 6	3353 E 4	3320 B 2	3309 E 3	3257 D 2	2355 A 5	2337 B 4	2326 C 5	2315 A 5	2259 A 7	1306 B 6	0010 A 6

TRANSFORMER BOARD



version	NC12
10W	3103 308 07920
15W	3103 308 08050
20W	3103 308 08060

3317	version
270R	10W
220R	15W
180R	20W

3318	version
270R	10W
220R	15W
180R	20W

2253	version
4700u	10W
4700u	15W
6800u	20W

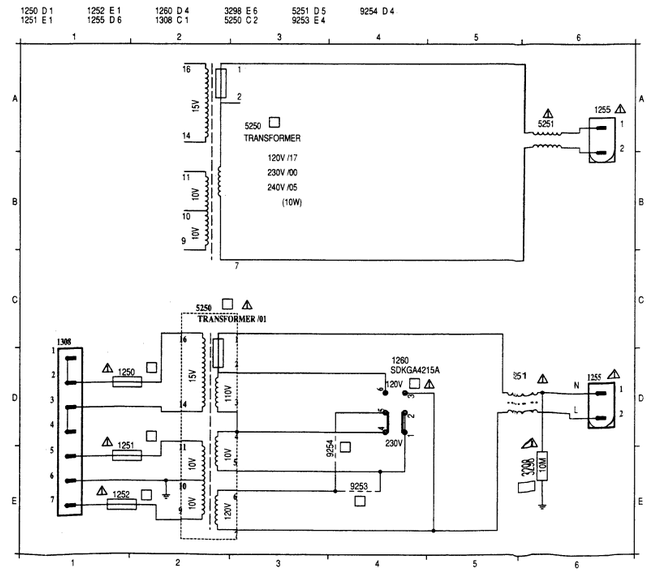
0010 D11
0011 D12
0013 L2
0014 K3
0015 K3
1300 B2
1301 D2
1302 I2
1303 M2
1304 C13
1305 K2
1306 L13
1307 M2
2250 L12
2251 L12
2252 L11
2253 L10
2254 K8
2255 L8
2256 J5
2257 N12
2258 N12
2259 M11
2260 N10
2261 N10
2262 J5
2263 D9
2264 G8
2265 N4
2266 K7
2267 K6
2311 B4
2312 F4
2315 B8
2316 F8
2317 B7
2318 F7
2319 C7
2320 G7
2321 C8
2322 G8
2323 B7
2324 F7
2325 A7
2326 E7
2327 A8
2328 E8
2329 A10
2330 E10
2331 B8
2332 F8
2333 B10
2334 F10
2335 C10
2336 G10
2337 C10
2338 G10
2339 C11
2340 G11
2345 E13
2346 D13
2350 D8
2351 D4
2352 D3
2353 D3
2354 H4
2355 B8
2356 F8
2357 I7
2361 E12
2362 D12
3250 J10
3251 K9
3252 L9
3254 K8
3255 K8
3256 K7
3257 M7
3258 L6
3259 L5
3260 L6
3261 K5
3262 K6
3263 K7
3264 K5
3270 I10
3307 C4
3308 G4
3309 B5
3310 F5
3311 B5
3312 F5
3313 C5
3314 G5
3315 C6
3316 G6
3317 C7
3318 G8
3319 C10
3320 G10
3321 C11
3322 F11
3323 B8
3324 F7
3325 B6
3326 F6
3349 D12
3350 D7
3351 I7
3352 I8
3353 I8
3354 H3
3355 I4
5309 M4
5311 A8
5312 E8
5315 D8
5316 D8
5318 E11
5320 E11
6250 L12
6251 J10
6252 J6
6253 K7
6254 K8
6255 N12
6256 N12
6257 N11
6258 N11
6259 D7
6261 M4
6270 I10
6350 D6
6351 I9
6352 I8
6354 D6
7250 K9
7252 J8
7253 L8
7254 M7
7255 K6
7309 C5
7310 G5
7311 C6
7312 G6
7313 A9
7314 E9
7350 I6
7351 I7
7352 H4
T001 I3
T002 J5
T003 M10
T004 J3
T005 J3
T006 K3
T007 B3
T008 B3
T009 C3
T010 E3
T011 D3
T012 D3
T013 D3
T014 N3
T015 N3
T016 N3
T017 M12
T018 M12
T019 M13
T020 C8
T021 E8
T022 L12
T023 M12
T024 K2
T025 K2
T026 D11
T027 D11
T028 E11
T029 E11
T030 D11
T031 E13
T032 E13
T033 E13
T034 E13
T035 D13
T036 D13
T037 D13
T038 C13
T039 K10

COMPONENTS DEPENDING ON THE VERSION

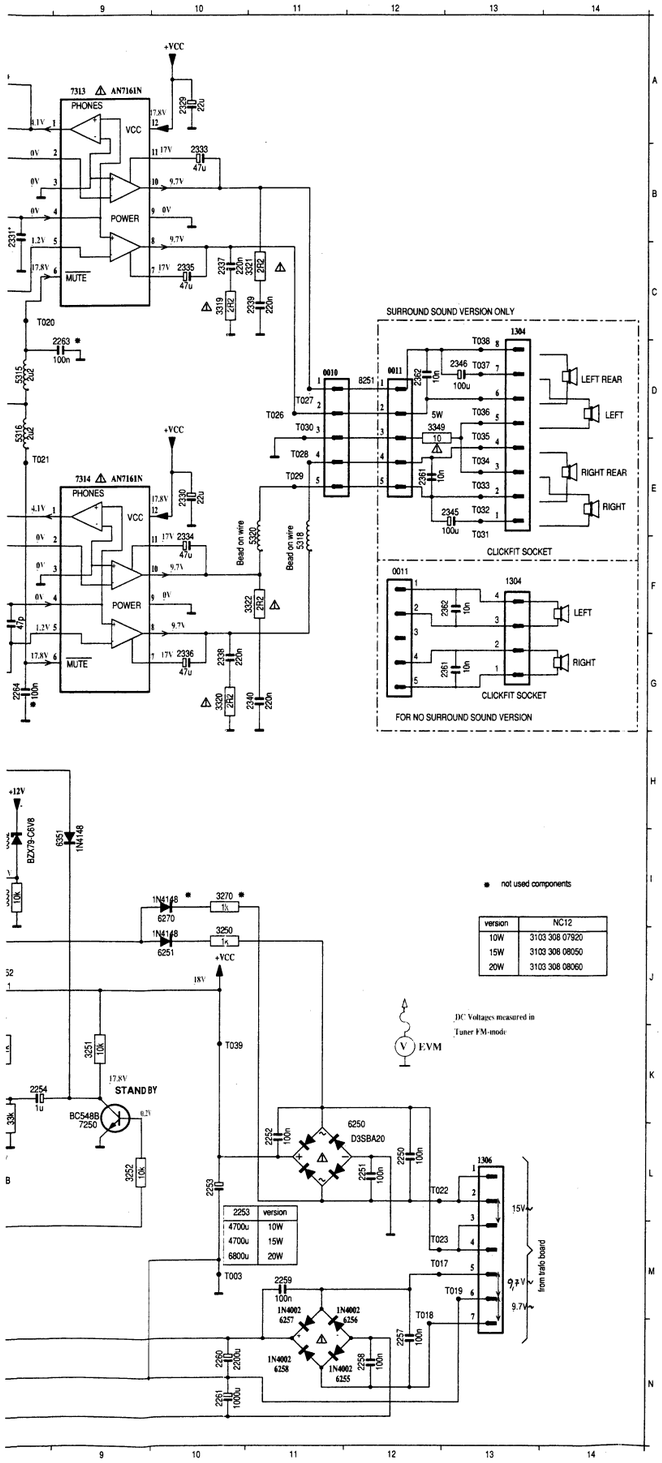
□ COMPONENTS

VERSION	1260	9253	9254	5250	3298	VALUE OF FUSE 1250 (1254)	1251 (1253)	1252 (1256)
/00 (IEC 230V)				/00		5A	630mA	630mA
/05 [1] (240V)		X		/01		5A	630mA	630mA
/17 (UL 120V)				/17	X	6,3A	1,25A	1,25A
/01 /10 (120V,230V)	X		X	/01		5A	630mA	630mA
/05 [1] (240V)				/05		5A	630mA	630mA

1) for 15V and 20V versions /01 transformer
for 10W version /05 transformer



TRANSFORMER BOARD



0010 D11
0011 D12
0013 L2
0014 K3
0015 K3
1300 B2
1301 D2
1302 I2
1303 M2
1304 C13
1305 K2
1306 L13
1307 M2
2250 L12
2251 L12
2252 L11
2253 L10
2254 K8
2255 L8
2256 J5
2257 N12
2258 N12
2259 M11
2260 N10
2261 N10
2262 J5
2263 D9
2264 G8
2265 N4
2266 K7
2267 K6
2311 B4
2312 F4
2315 B8
2316 F8
2317 B7
2318 F7
2319 C7
2320 G7
2321 C8
2322 G8
2323 B7
2324 F7
2325 A7
2326 E7
2327 A8
2328 E8
2329 A10
2330 E10
2331 B8
2332 F8
2333 B10
2334 F10
2335 C10
2336 G10
2337 C10
2338 G10
2339 C11
2340 G11
2345 E13
2346 D13
2350 D8
2351 D4
2352 D3
2353 D3
2354 H4
2355 B8
2356 F8
2357 I7
2361 E12
2362 D12
3250 J10
3251 K9
3252 L9
3254 K8
3255 K8
3256 K7
3257 M7
3258 L6
3259 L5
3260 L6
3261 K5
3262 K6
3263 K7
3264 K5
3270 I10
3307 C4
3308 G4
3309 B5
3310 F5
3311 B5
3312 F5
3313 G5
3314 G5
3315 G6
3316 G6
3317 C7
3318 G8
3319 C10
3320 G10
3321 C11
3322 F11
3323 B8
3324 F7
3325 B6
3326 F6
3349 D12
3350 D7
3351 I7
3352 I8
3353 I8
3354 H3
3355 I4
5309 M4
5311 A8
5312 E8
5315 D8
5316 D8
5318 E11
5320 E11
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6252 J6
6253 K7
6254 K8
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6256 N12
6257 N11
6258 N11
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6261 M4
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7254 M7
7255 K6
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7312 G6
7313 A9
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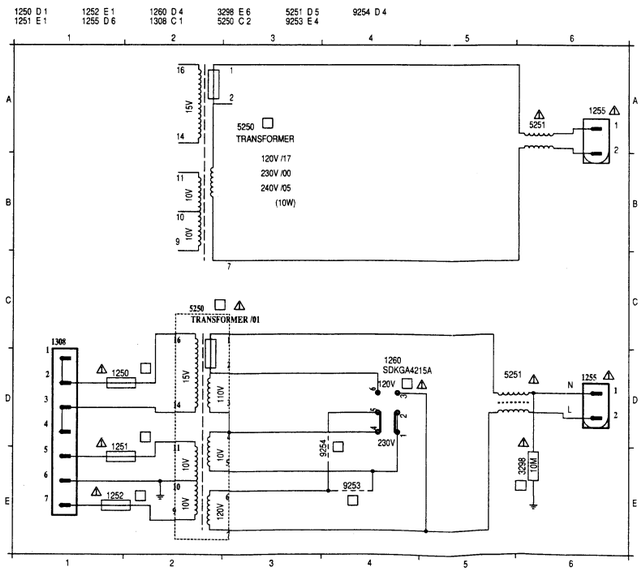
T009 C3
T010 E3
T011 D3
T012 D3
T013 D3
T014 N3
T015 N3
T016 N3
T017 M12
T018 M12
T019 M13
T020 C8
T021 E8
T022 L12
T023 M12
T024 K2
T025 K2
T026 D11
T027 D11
T028 E11
T029 E11
T030 D11
T031 E13
T032 E13
T033 E13
T034 E13
T035 D13
T036 D13
T037 D13
T038 C13
T039 K10

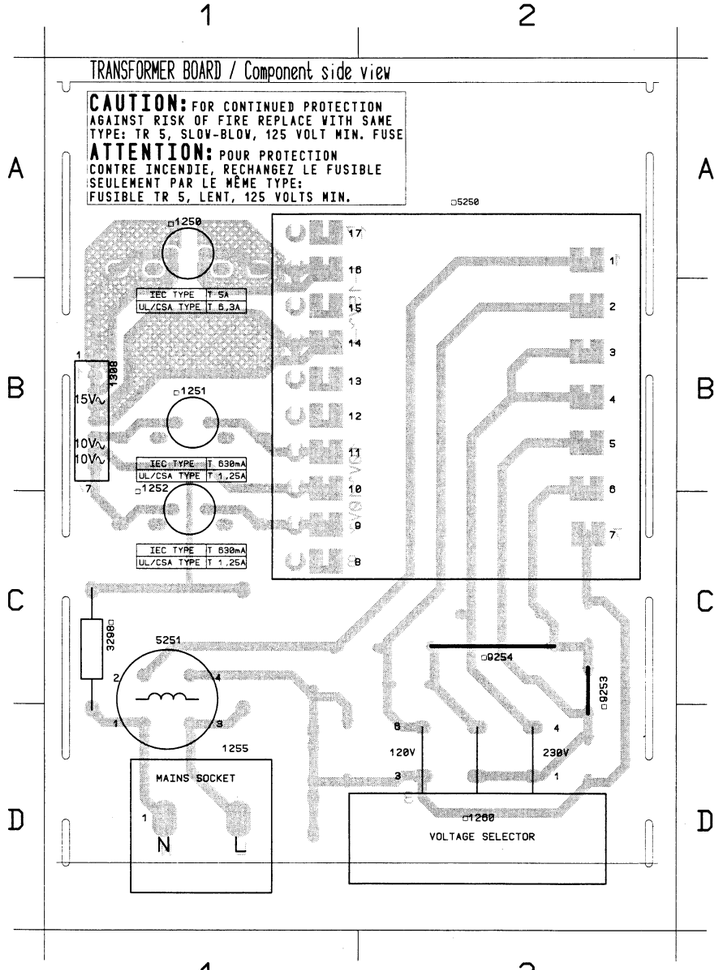
◻ COMPONENTS DEPENDING ON THE VERSION

VERSION \ COMPONENTS ◻	1260	9253	9254	5250	3298	VALUE OF FUSE 1250 (1254)	1251 (1253)	1252 (1255)
/00 (IEC 230V)				/00		5A	630mA	630mA
/05 [1] (240V)		X		/01		5A	630mA	630mA
/17 (UL 120V)				/17	X	6,3A	1,25A	1,25A
/01 /10 (120V,230V)	X		X	/01		5A	630mA	630mA
/05 [1] (240V)				/05		5A	630mA	630mA

1) for 15W and 20W versions /01 transformer
for 10W version /05 transformer

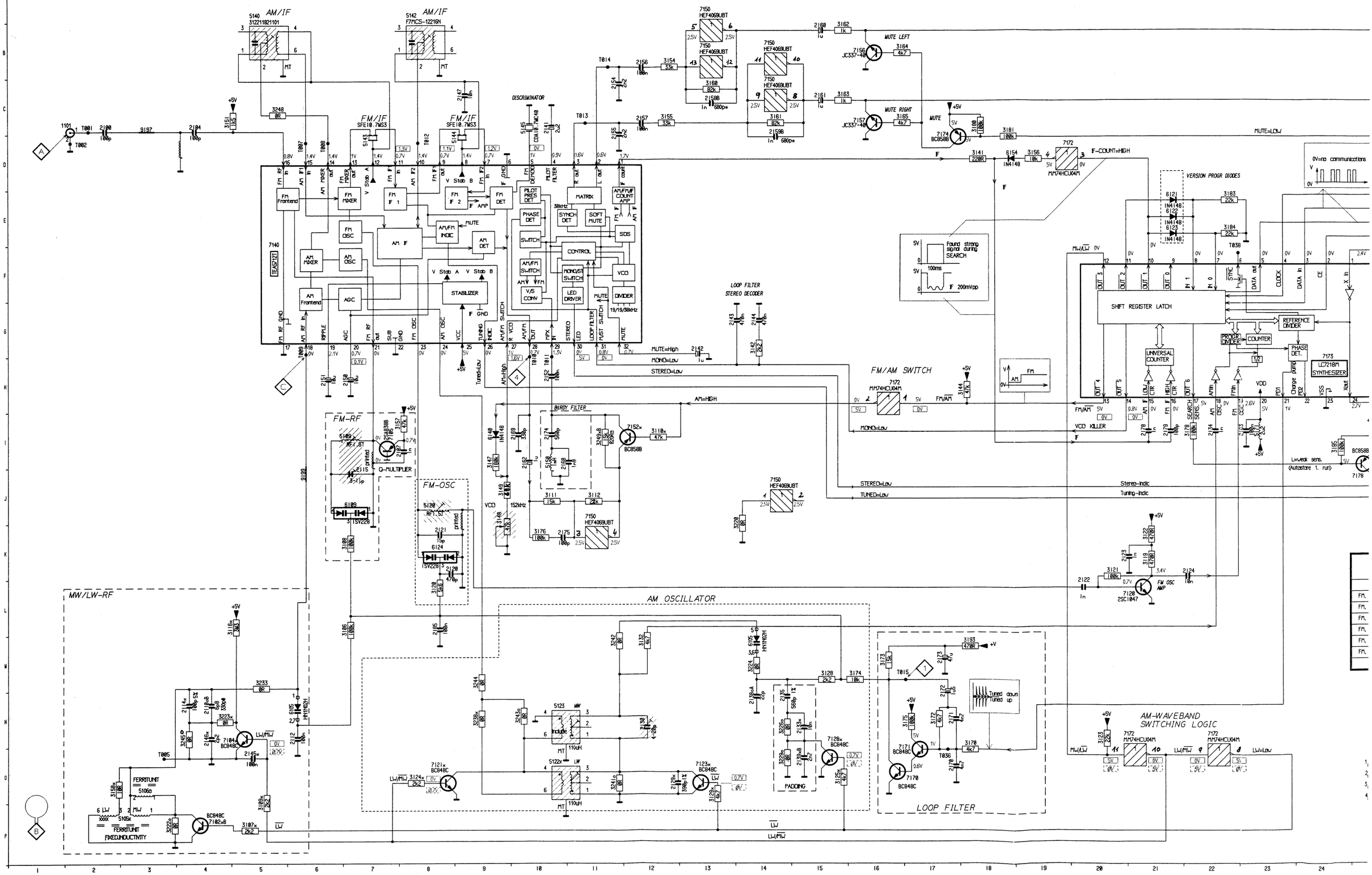


1250 D 1
1251 E 1
1252 E 1
1255 D 6
1260 D 4
1308 C 1
3298 E 6
5250 C 2
5251 D 5
9253 E 4
9254 D 4



1250 B 1
1251 B 1
1252 C 1
1253 B 1
1254 B 1
1255 D 1
1256 C 1
1257 D 1
1258 D 1
1208 D 2
1308 B 1
3298 C 1
3299 C 1
5250 B 2
5251 C 1
9250 C 2
9251 D 2
9252 C 2
9253 C 2
9254 C 2
9255 C 2
9256 C 2
9257 D 1

TUNER UNIT ECO4 (MIDI)



VERSION PROGRAMMING DIODES			
	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	
X=DIODE MOUNTED			

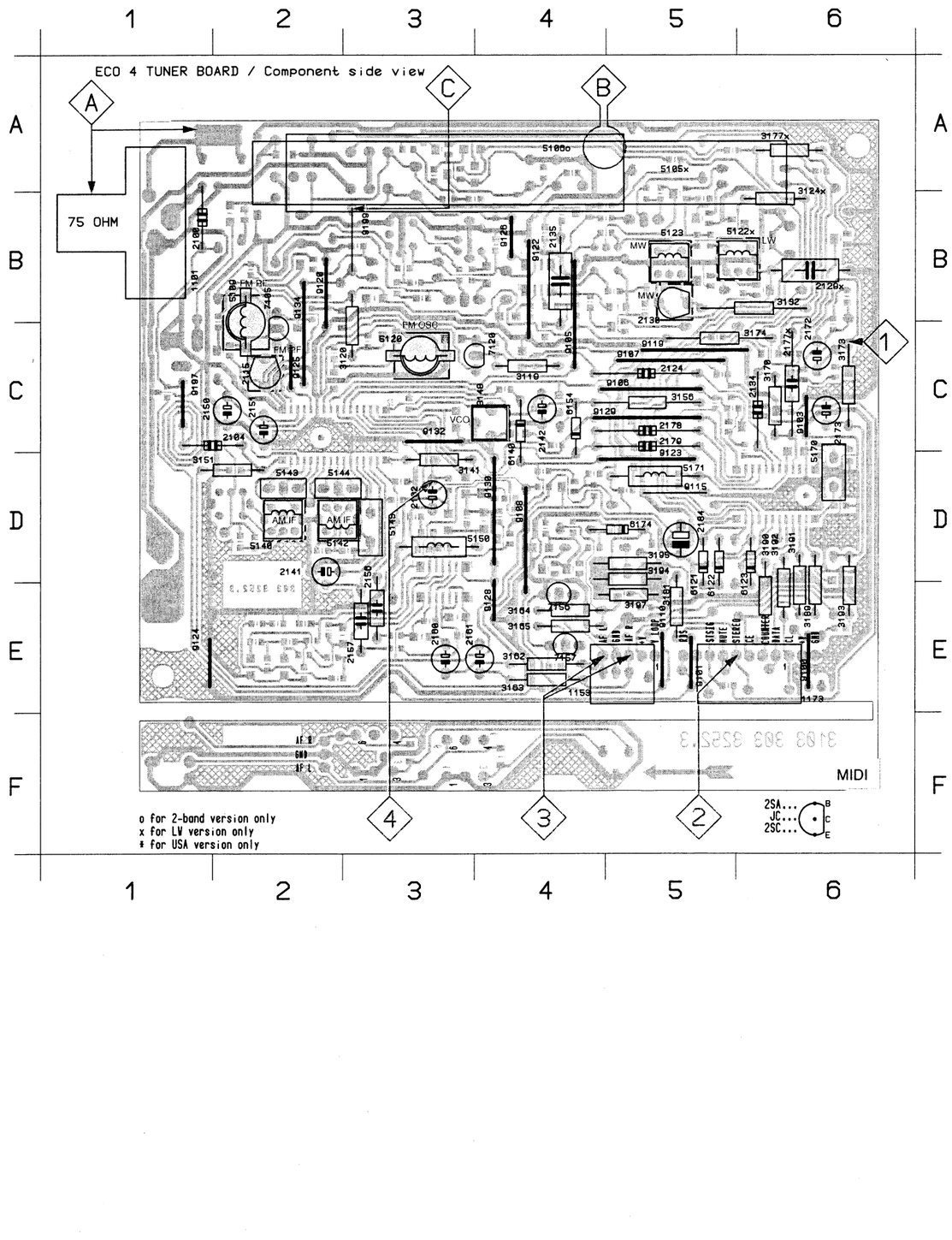
Vdc_FM_mode_stereo
Vdc_MW_mode
Vdc_LW_mode

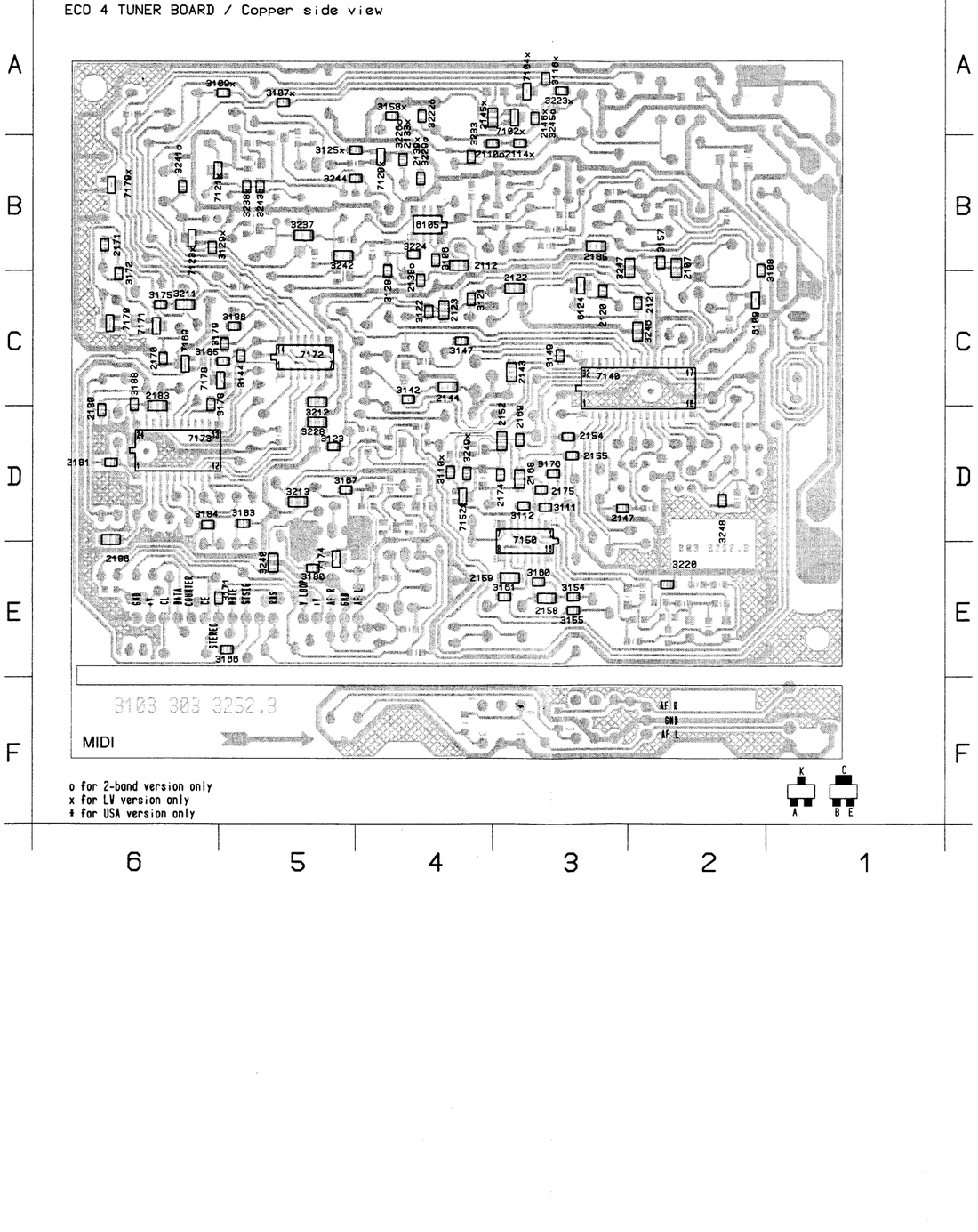
voltages measured while set is tuned to a strong transmitter

o for 2-band version only
x for LW version only
* for USA version only

1101 B 1 2134 C 6 2161 E 4 3120 B 3 3164 E 4 3191 D 6 5120 C 3 5170 D 6 7120 C 4 9108 D 4 9126 B 4
1153 E 5 2135 B 4 2162 D 3 3124x B 6 3165 E 4 3192 D 6 5122x B 5 5171 D 5 7150 E 4 9110 E 5 9128 D 4
1173 E 6 2141 D 2 2172 C 6 3132 B 5 3170 C 6 3193 E 6 5123 B 5 6121 D 5 7157 E 4 9115 D 5 9129 C 4
2100 A 1 2142 C 4 2173 C 6 3141 D 3 3173 C 6 3194 D 4 5140 D 2 6122 D 5 9100 E 6 9119 C 5 9130 D 4
2104 C 1 2150 C 2 2177x C 6 3148 C 3 3174 C 5 3195 D 4 5142 D 3 6123 D 6 9101 E 5 9120 C 2 9132 C 3
2115 C 2 2151 C 2 2178 C 4 3151 D 1 3177x A 6 3197 E 4 5143 D 2 6140 D 4 9103 C 6 9122 B 4 9134 B 2
2124 C 4 2158 D 3 2179 C 4 3156 C 4 3181 D 5 5185x A 4 5144 D 2 6154 C 4 9105 C 4 9123 D 4 9197 C 1
2129x B 6 2157 E 3 2184 D 5 3162 E 4 3189 D 6 5186o A 4 5145 D 3 6174 D 4 9106 C 4 9124 E 1 9199 B 3
2130 B 5 2160 E 3 3119 C 4 3163 E 4 3190 D 6 5180 C 2 5150 D 3 7105 C 2 9107 C 5 9125 C 2

7171 C 6 6109 C 2 3238x B 5 3211 C 6 3171 E 5 3142 C 4 3108 B 2 2169 D 3 2139x B 4 T036 B 6 T016 A 6 T001 B 1
7172 C 5 6124 C 3 3240 E 5 3212 C 5 3172 C 6 3144 C 5 3109x A 5 2170 C 6 2143 C 3 T038 D 6 T020 E 4 T002 B 1
7173 D 6 7102x A 3 3241o B 6 3213 D 5 3175 C 6 3147 C 4 3110x D 4 2171 B 6 2144 C 4 2107 B 2 T021 E 4 T005 E 1
7174 E 5 7104x A 3 3242 B 5 3220 E 2 3176 D 3 3149 C 3 3111 D 3 2174 D 3 2145x A 3 2110o B 3 T022 E 5 T007 D 2
7178 C 5 7121x B 6 3243o B 5 3222o A 4 3178 C 6 3154 E 3 3112 D 3 2175 D 3 2146x A 3 2112 B 4 T023 D 5 T008 D 2
7179x B 6 7123x B 6 3244 B 4 3223x A 3 3179 C 5 3155 E 3 3116x A 3 2180 D 6 2147 D 3 2114x B 3 T027 E 6 T009 B 2
7128x B 4 3245x A 3 3224 B 4 3180 E 5 3157 B 2 3121 C 4 2181 D 6 2152 D 3 2120 C 3 T028 E 6 T010 D 3
7140 C 2 3246 C 2 3226o B 4 3183 D 5 3158x A 4 3122 C 4 2183 C 6 2154 D 3 2121 C 2 T029 E 6 T011 C 3
7150 D 3 3247 B 2 3228 D 5 3184 D 6 3160 E 3 3123 D 5 2185 B 3 2155 D 3 2122 C 3 T030 E 6 T012 D 2
7152x D 4 3248 D 2 3229o B 4 3185 C 5 3161 E 3 3125x B 4 2186 D 6 2158 E 3 2123 C 4 T031 E 6 T013 E 2
7169 C 6 3249x D 4 3233 B 4 3186 C 5 3166 E 5 3128 B 4 3100 B 4 2159 E 3 2133x B 4 T032 E 5 T014 D 3
7170 C 6 6105 B 4 3237 B 5 3188 C 6 3167 D 5 3129x B 6 3107x A 5 2168 D 3 2136o C 4 T033 E 5 T015 C 6





TUNER

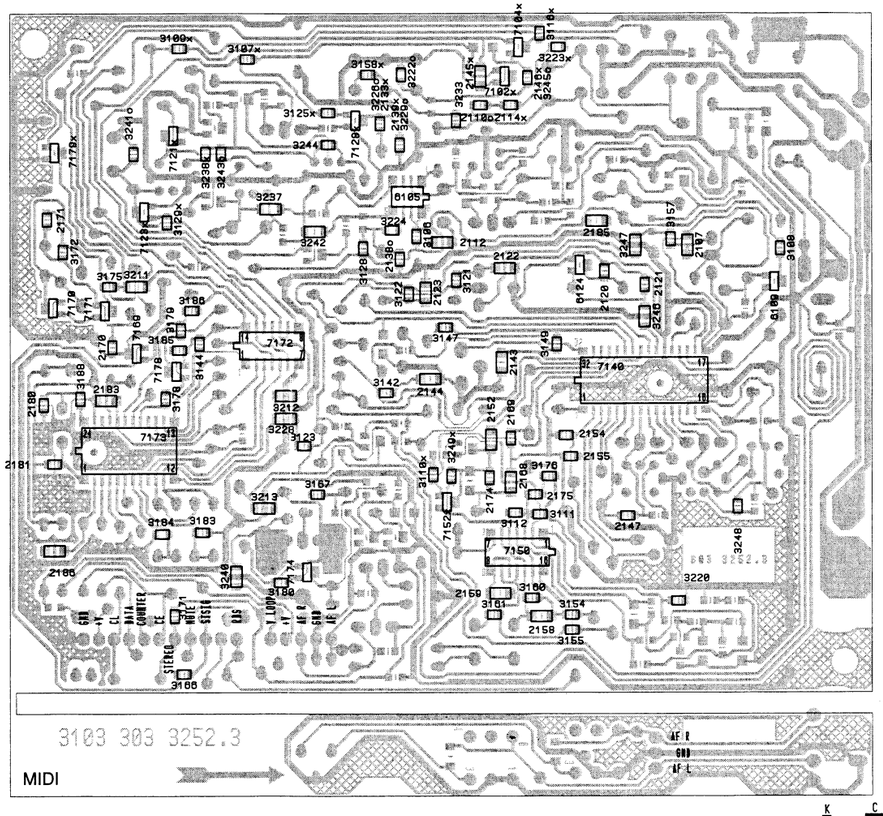
W
VARICA
FM /00/ 87.5 -
FM /14 65.81
MW /01 2-band ver 530 -
LW /00/ 153 -
MW /00 522 -
FM - RI
FM /00/
FM /14 East
VCO
FM
AM - IF
MW
AM - RI
LW
MW /00 3-ba
MW /01 2-ba

* Use Se
1) Adjust bracke

repeat

7171 C 6	6109 C 2	3238x B 5	3211 C 6	3171 E 5	3142 C 4	3108 B 2	2169 D 3	2139x B 4	T036 B 6	T016 A 6	T001 B 1
7172 C 5	6124 C 3	3240 E 5	3212 C 5	3172 C 6	3144 C 5	3109x A 5	2170 C 6	2143 C 3	T038 D 6	T020 E 4	T002 B 1
7173 D 6	7102x A 3	3241o B 6	3213 D 5	3175 C 6	3147 C 4	3110x D 4	2171 B 6	2144 C 4	2107 B 2	T021 E 4	T005 E 1
7174 E 5	7104x A 3	3242 B 5	3220 E 2	3176 D 3	3149 C 3	3111 D 3	2174 D 3	2145x A 3	2110o B 3	T022 E 5	T007 D 2
7178 C 5	7121x B 6	3243o B 5	3222o A 4	3178 C 6	3154 E 3	3112 D 3	2175 D 3	2146x A 3	2112 B 4	T023 D 5	T008 D 2
7179x B 6	7123x B 6	3244 B 4	3223x A 3	3179 C 5	3155 E 3	3116x A 3	2180 D 6	2147 D 3	2114x B 3	T027 E 6	T009 B 2
	7128x B 4	3245x A 3	3224 B 4	3180 E 5	3157 B 2	3121 C 4	2181 D 6	2152 D 3	2120 C 3	T028 E 6	T010 D 3
	7140 C 2	3246 C 2	3226o B 4	3183 D 5	3158x A 4	3122 C 4	2183 C 6	2154 D 3	2121 C 2	T029 E 6	T011 C 3
	7150 D 3	3247 B 2	3228 D 5	3184 D 6	3160 E 3	3123 D 5	2185 B 3	2155 D 3	2122 C 3	T030 E 6	T012 D 2
	7152x D 4	3248 D 2	3229o B 4	3185 C 5	3161 E 3	3125x B 4	2186 D 6	2158 E 3	2123 C 4	T031 E 6	T013 E 2
	7169 C 6	3249x D 4	3233 B 4	3186 C 5	3165 E 5	3128 B 4	3106 B 4	2159 E 3	2133x B 4	T032 E 5	T014 D 3
	7170 C 6	6105 B 4	3237 B 5	3188 C 6	3167 D 5	3129x B 6	3107x A 5	2160 D 3	2138o C 4	T033 E 5	T015 C 6

ECO 4 TUNER BOARD / Copper side view



o for 2-band version only
x for LW version only
* for USA version only

TUNER Adjustment table (ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM /00/01/05/10/17			108 MHz	5120	1	8V ± 0.2V
87.5 - 108MHz			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe			108 MHz	5120		8V ± 0.2V
65.81 - 108MHz			65.81 MHz	check		0.8V ± 0.4V
MW /01/17			1710kHz	5123		9V±0.1V (7.5±0.7V) 1)
2-band version, 10kHz grid 530 - 1710kHz			530kHz	check		1V±0.4V (1.1±0.5V) 1)
LW /00/05/10/14			279kHz	5122		8V±0.2V (7.5±1.5V) 1)
153 - 279kHz			153kHz	check		1V±0.4V (1.1±0.5V) 1)
MW /00/05/10/14			1611kHz	5123		8V±0.1V (7.5±0.5V) 1)
522 - 1611kHz			522kHz	check		1V±0.4V (1.1±0.5V) 1)
FM - RF						
FM /00/01/05/10/17	108MHz	A	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz	mod=1kHz Δf=22.5kHz	108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B' mod=1kHz 30% AM	198kHz	5122	4	MAX
MW /00/05/10/14 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW /01/17 2-band version	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.
1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

↕ repeat

TUNER 92

FM-FRONTEND

AM-IF

FM-IF

FM-DETECTOR

SEARCH LEVEL

AM-FRONTEND

FERROCEPTOR

AM-OSC

ANTI BIRDY FILTER

CROSSTALK

LOOPFILTER

SHIFT REGISTER LATCH

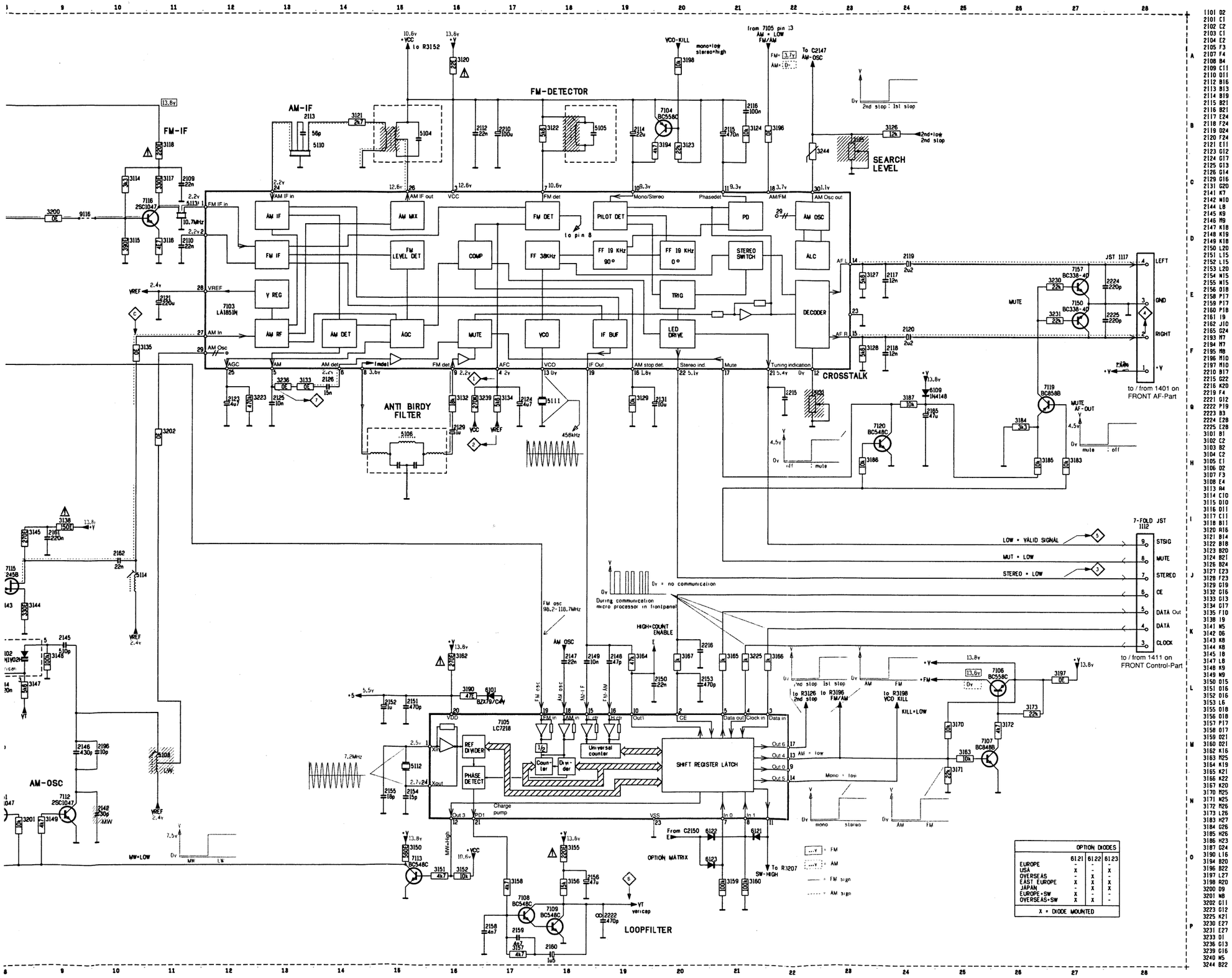
OPTION MATRIX

AM Frame antenne

Varicap voltage

FM :	108MHz	7-9v
FM :	87.5MHz	11.5-12v
LW :	279kHz	0.5v --0.1v
LW :	153kHz	1v --0.3v
MW :	1611kHz	0.5v --0.1v
MW :	522kHz	1.1v --0.3v

ES. 3104-217-03320. SERY. ES-UNIT

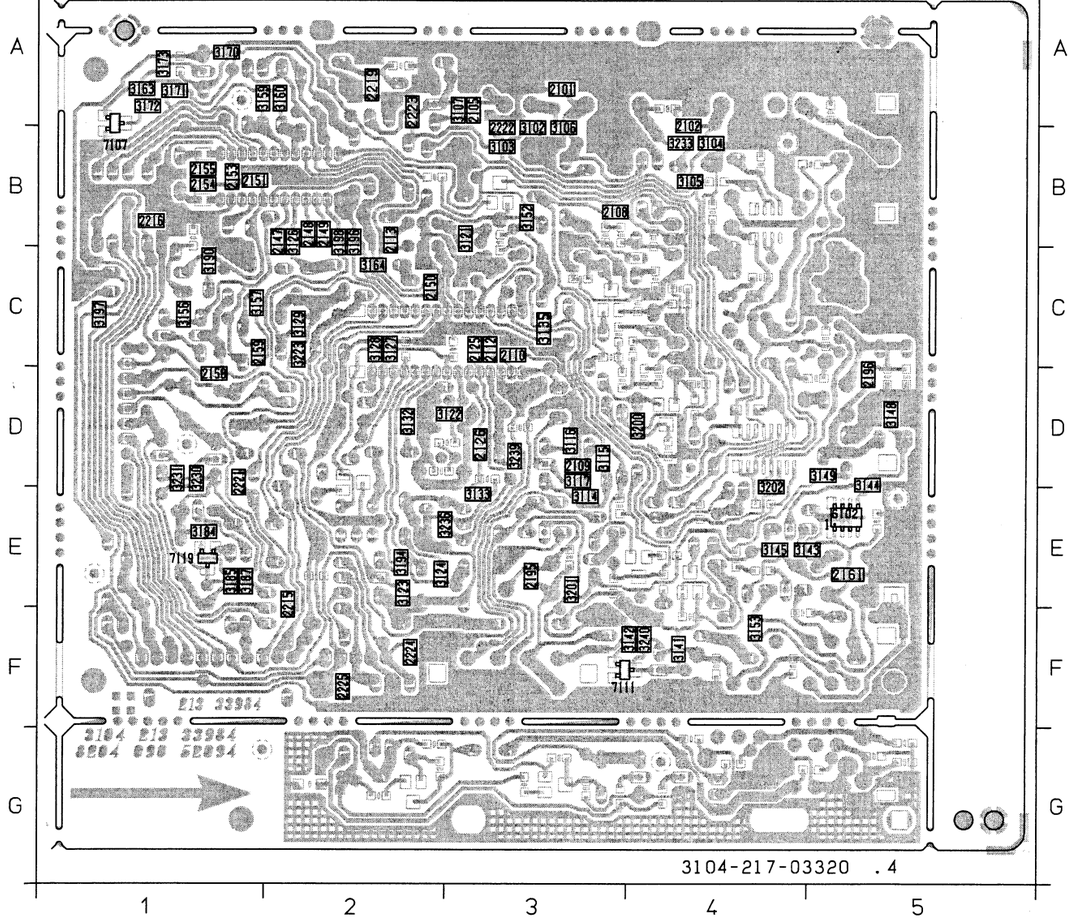


1101 D2 5104 B15
2101 C1 5105 B18
2102 C2 5106 H15
2103 C1 5111 D18
2104 E2 5111 G18
2105 F3 5112 M15
2107 F4 5127 K7
2108 B4 6101 L17
2109 C11 6102 K8
2110 D11 6109 G24
2112 B16 6121 O21
2113 B13 6122 O21
2114 B19 6123 O21
2115 B21 7101 F4
2116 B21 7103 E12
2117 E24 7104 B20
2118 F24 7105 M17
2119 D24 7106 L26
2120 F24 7107 M25
2121 E11 7108 P17
2123 G12 7109 P18
2124 G17 7111 O5
2125 G13 7112 M9
2126 G14 7113 O15
2129 G16 7114 M6
2131 G20 7115 J8
2141 K7 7116 C11
2142 M10 7119 G27
2144 L8 7120 G24
2145 K9 7150 E27
2146 M9 7151 N8
2147 K18 7157 E27
2148 K19 9116 D9
2149 K18 9117 O5
2150 L20
2151 L15
2152 L15
2153 L20
2154 M15
2155 M15
2156 D18
2158 P17
2159 P17
2160 P18
2161 I9
2162 J10
2165 G24
2193 M7
2194 M7
2195 M8
2196 M10
2197 M10
2210 B17
2215 G22
2216 K20
2219 F4
2221 Q12
2222 P19
2223 B3
2224 E28
2225 E28
3101 B1
3102 C2
3103 B2
3104 C2
3105 E1
3106 D2
3107 F3
3108 E4
3113 B4
3114 C10
3115 D10
3116 D11
3117 C11
3118 B11
3120 R16
3121 B14
3122 B18
3123 B20
3124 B21
3126 B24
3127 E23
3128 F23
3129 D19
3132 G16
3133 D13
3134 G17
3135 F10
3138 I9
3141 N5
3142 D6
3143 K8
3144 K8
3145 I8
3147 L8
3148 K9
3149 M9
3150 O15
3151 D16
3152 D16
3153 L6
3155 D18
3156 D18
3157 P17
3158 D17
3159 O21
3160 O21
3162 K16
3163 M25
3164 K19
3165 K21
3166 K22
3167 K20
3170 M25
3171 N25
3172 M26
3173 L26
3183 H27
3184 G26
3185 H26
3186 H23
3187 G24
3190 L16
3194 B20
3196 B22
3197 L27
3198 R20
3200 D9
3201 N8
3202 C11
3223 G12
3225 K21
3230 E27
3231 E27
3233 D1
3236 G13
3239 G16
3240 N5
3244 B22

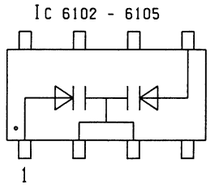
2101	A3	2125	C3	2154	B1	2216	B1	3103	B3	3117	D3	3129	C2	3145	E4
2102	B4	2126	D3	2155	B1	2219	A2	3104	B4	3121	B3	3132	D2	3148	D5
2105	A3	2147	B2	2158	D1	2221	D1	3105	B4	3122	D3	3133	E3	3149	D5
2108	B3	2148	B2	2159	C1	2222	B3	3106	B3	3123	E2	3135	C3	3152	B3
2109	D3	2149	B2	2161	E5	2223	A2	3107	A3	3124	E3	3141	F4	3153	F4
2110	C3	2150	C2	2195	E3	2224	F2	3114	E3	3126	B2	3142	F4	3156	C1
2112	C3	2151	B1	2196	D5	2225	F2	3115	D3	3127	C2	3143	E5	3157	C1
2113	B2	2153	B1	2215	E2	3102	B3	3116	D3	3128	C2	3144	E5	3159	A2

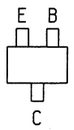
3160	A2	3185	E1	3201	E3	3240	F4								
3163	A1	3187	E1	3202	E4	6102	E5								
3164	C2	3190	C1	3223	C2	7107	B1								
3170	A1	3194	E2	3230	D1	7111	F3								
3171	A1	3196	B2	3231	D1	7119	E1								
3172	A1	3197	C1	3233	B4	TUNER	A1								
3173	A1	3198	B2	3236	E3										
3184	E1	3200	D4	3239	D3										

TUNER 92 Copperside view



Ic 6102 - 6105

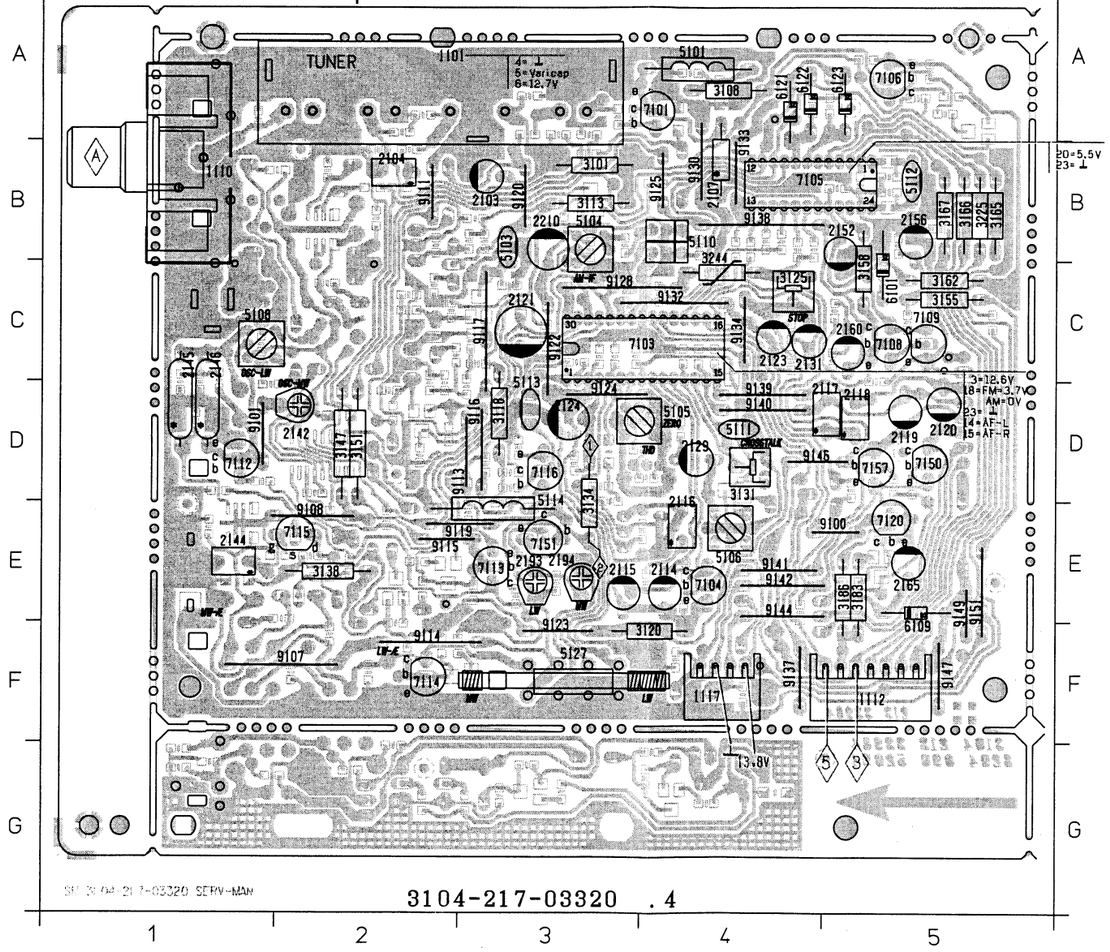




1101	A2	2119	D5	2156	B5	3131	D4	3186	E5	5113	D3	7106	A5	9100	E5
1110	B1	2120	D5	2160	C5	3134	D3	3225	B5	5114	E3	7108	C5	9101	D1
1112	F5	2121	C3	2165	E5	3138	E2	3244	C4	5127	F3	7109	C5	9107	F2
1117	F4	2123	C4	2193	E3	3147	D2	5101	A4	6101	C5	7112	D1	9108	E2
2103	B3	2124	D3	2194	E3	3151	D2	5103	B3	6109	F5	7113	E3	9111	B2
2104	B2	2129	D4	2210	B3	3155	C5	5104	B3	6121	A4	7114	F2	9113	D3
2107	B4	2131	C4	3101	B3	3158	C5	5105	D4	6122	A4	7115	E2	9114	F2
2114	E4	2142	D2	3108	A4	3162	C5	5106	E4	6123	A5	7116	D3	9115	E2
2115	E3	2144	E1	3113	B3	3165	B5	5108	C1	7101	A4	7120	E5	9116	D3
2116	E4	2145	C1	3118	D3	3166	B5	5110	B4	7103	C4	7150	D5	9117	C3
2117	D5	2146	C1	3120	F4	3167	B5	5111	D4	7104	E4	7151	E3	9119	E3
2118	D5	2152	B5	3125	C4	3183	E5	5112	B5	7105	B4	7157	D5	9120	B3

9122	C3	9140	D4												
9123	F3	9141	E4												
9124	D3	9142	E4												
9125	B4	9144	E4												
9128	C3	9146	D4												
9130	B4	9147	F5												
9132	C4	9149	E5												
9133	B4	9151	E5												
9134	C4														
9137	F4														
9138	B4														
9139	D4														

TUNER 92 Component side view

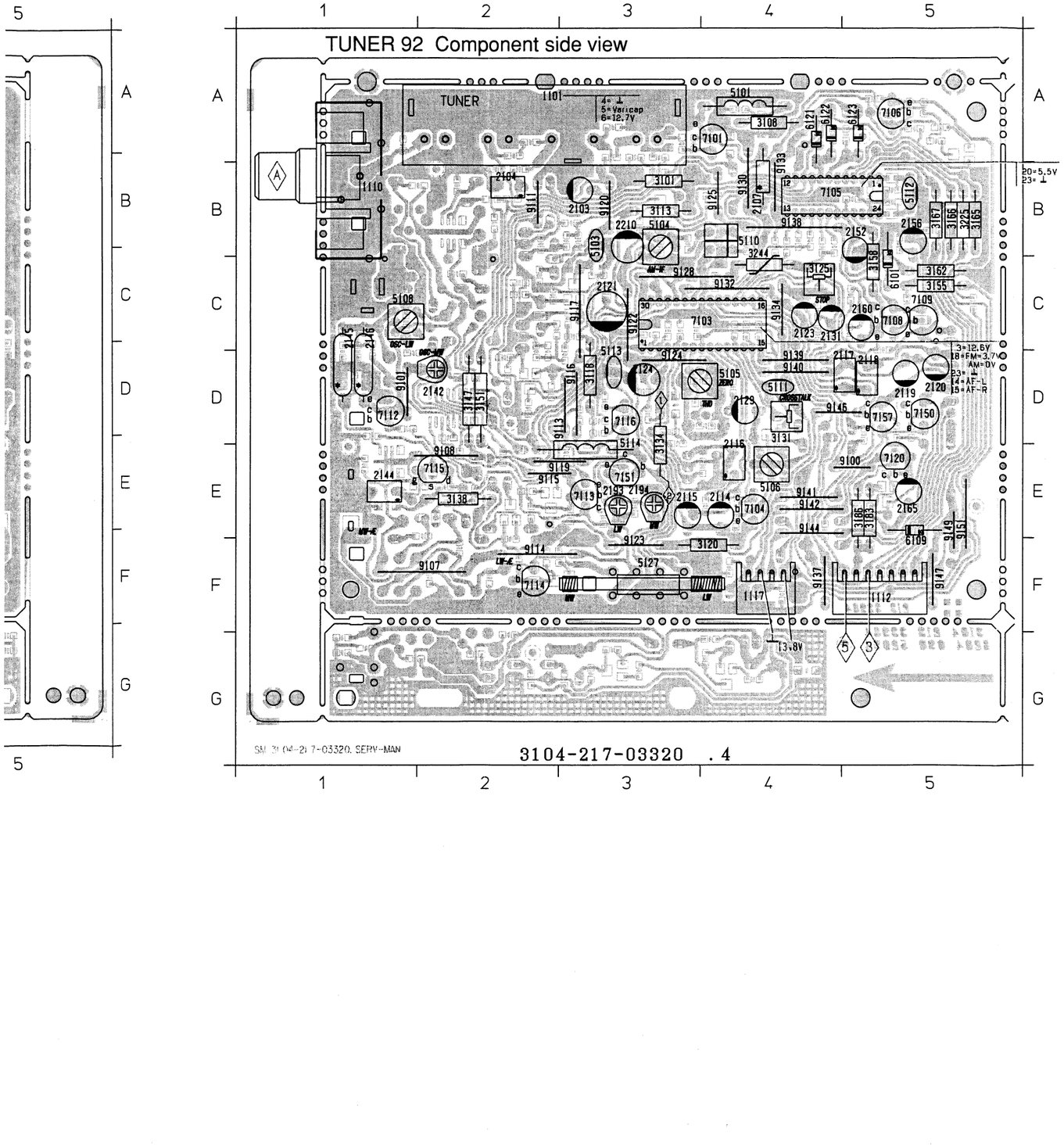


TUNER 9	
Wave	
VARICAP	
FM	
	87.5 - 1
AM	
2-band version,	
	530 - 1
LW	
	153 - 27
MW	
	522 - 16
FM IF	
FM	
STEREO	
FM	
SEARCH	
FM	
AM - IF	
MW	
AM RF	
AM	
2-band version	
m=30%, 1k	
LW	
m=30%, 1k	
MW	
m=30%, 1k	

repeat

E3 3240 F4
E4 6102 E5
C2 7107 B1
D1 7111 F3
D1 7119 E1
B4 TUNER A1
E3
D3

1101 A2 2119 D5 2156 B5 3131 D4 3186 E5 5113 D3 7106 A5 9100 E5 9122 C3 9140 D4
1110 B1 2120 D5 2160 C5 3134 D3 3225 B5 5114 E3 7108 C5 9101 D1 9123 F3 9141 E4
1112 F5 2121 C3 2165 E5 3138 E2 3244 C4 5127 F3 7109 C5 9107 F2 9124 D3 9142 E4
1117 F4 2123 C4 2193 E3 3147 D2 5101 A4 6101 C5 7112 D1 9108 E2 9125 B4 9144 E4
2103 B3 2124 D3 2194 E3 3151 D2 5103 B3 6109 F5 7113 E3 9111 B2 9128 C3 9146 D4
2104 B2 2129 D4 2210 B3 3155 C5 5104 B3 6121 A4 7114 F2 9113 D3 9130 B4 9147 F5
2107 B4 2131 C4 3101 B3 3158 C5 5105 D4 6122 A4 7115 E2 9114 F2 9132 C4 9149 E5
2114 E4 2142 D2 3108 A4 3162 C5 5106 E4 6123 A5 7116 D3 9115 E2 9133 B4 9151 E5
2115 E3 2144 E1 3113 B3 3165 B5 5108 C1 7101 A4 7120 E5 9116 D3 9134 C4
2116 E4 2145 C1 3118 D3 3166 B5 5110 B4 7103 C4 7150 D5 9117 C3 9137 F4
2117 D5 2146 C1 3120 F4 3167 B5 5111 D4 7104 E4 7151 E3 9119 E3 9138 B4
2118 D5 2152 B5 3125 C4 3183 E5 5112 B5 7105 B4 7157 D5 9120 B3 9139 D4

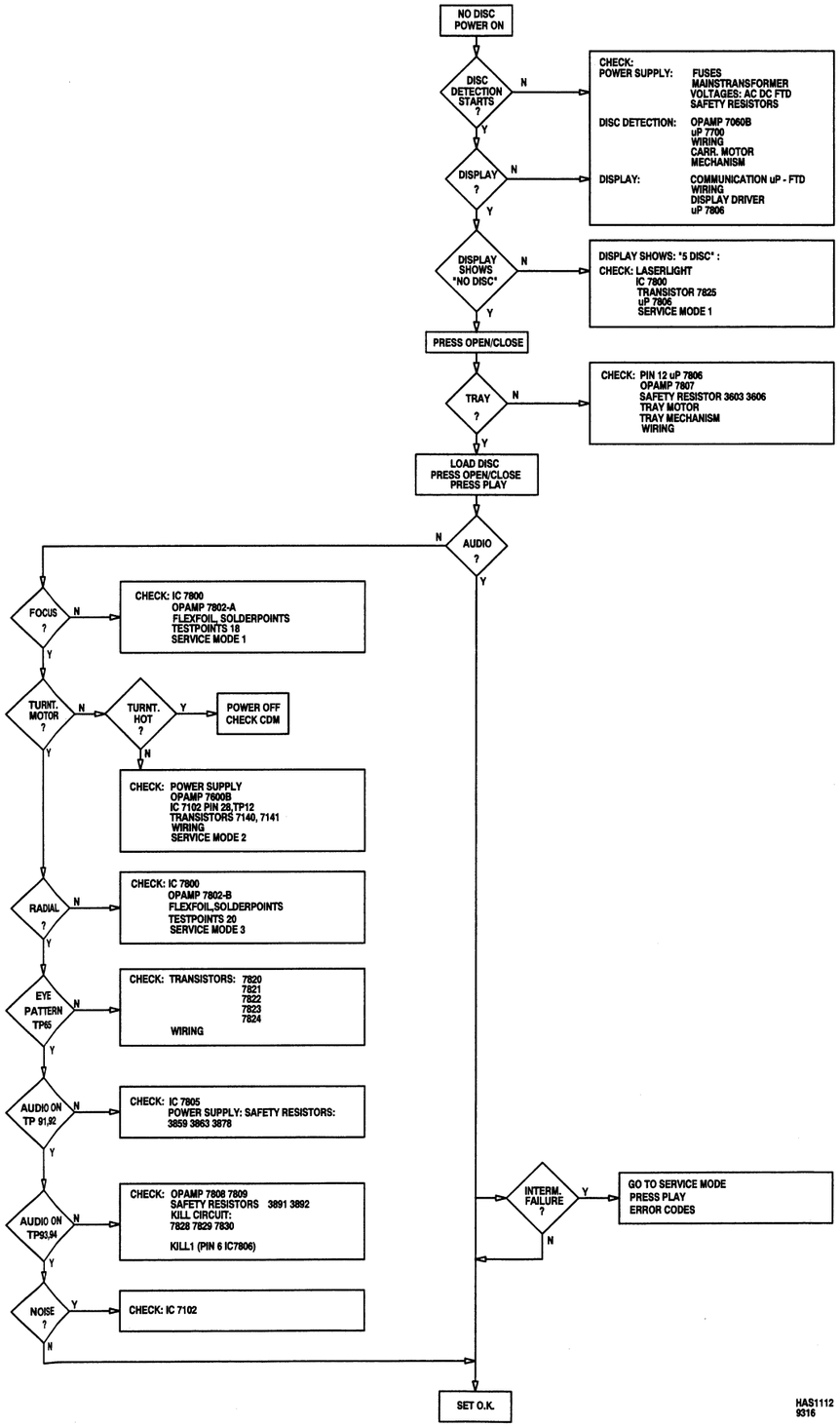


TUNER 92 Adjustment table (FM, MW - and FM, MW, LW - versions with AM ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM			108 MHz	check		7....9V
87.5 - 108MHz			87.5MHz	check		1.3....2V
AM 2-band version, 10kHz grid			1710kHz	5108		8.5V ± 0.1V
530 - 1710kHz			530kHz	check	◇6	1V ± 0.3V
LW			279kHz	5108		8.5V ± 0.1V
153 - 279kHz			153kHz	check		1V ± 0.1V
MW			1611kHz	2142		8.5V ± 0.1V
522 - 1611kHz			522kHz	check		1.1V ± 0.3V
FM IF						
FM	98 MHz, 1mV mod = 1kHz Δf = 75kHz	◇A	98MHz	5105	◇1 ◇2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz, 1mV 90% Left +9% pilot	◇A	98MHz	check	◇3	low < 1V
				3131	◇4	Right channel minimum
SEARCH SENSITIVITY						
FM	98 MHz, 15µV mod = 1kHz Δf = 75kHz	◇A	98MHz	3125	◇5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz as low as possible	100nF 50E ◇C	1494kHz	5104	◇7	symmetrical and max height
AM RF						
AM 2-band version, 10kHz grid m=30%, 1kHz	560kHz	◇B	560kHz	5107	◇7	MAX. ↕
	1600kHz		1600kHz	2141		
LW m=30%, 1kHZ	155kHz		155kHz	5127 LW		
	270kHz		270kHz	2193		
MW m=30%, 1kHz	558kHz		558kHz	5127 MW		
	1494kHz		1494kHz	2194		

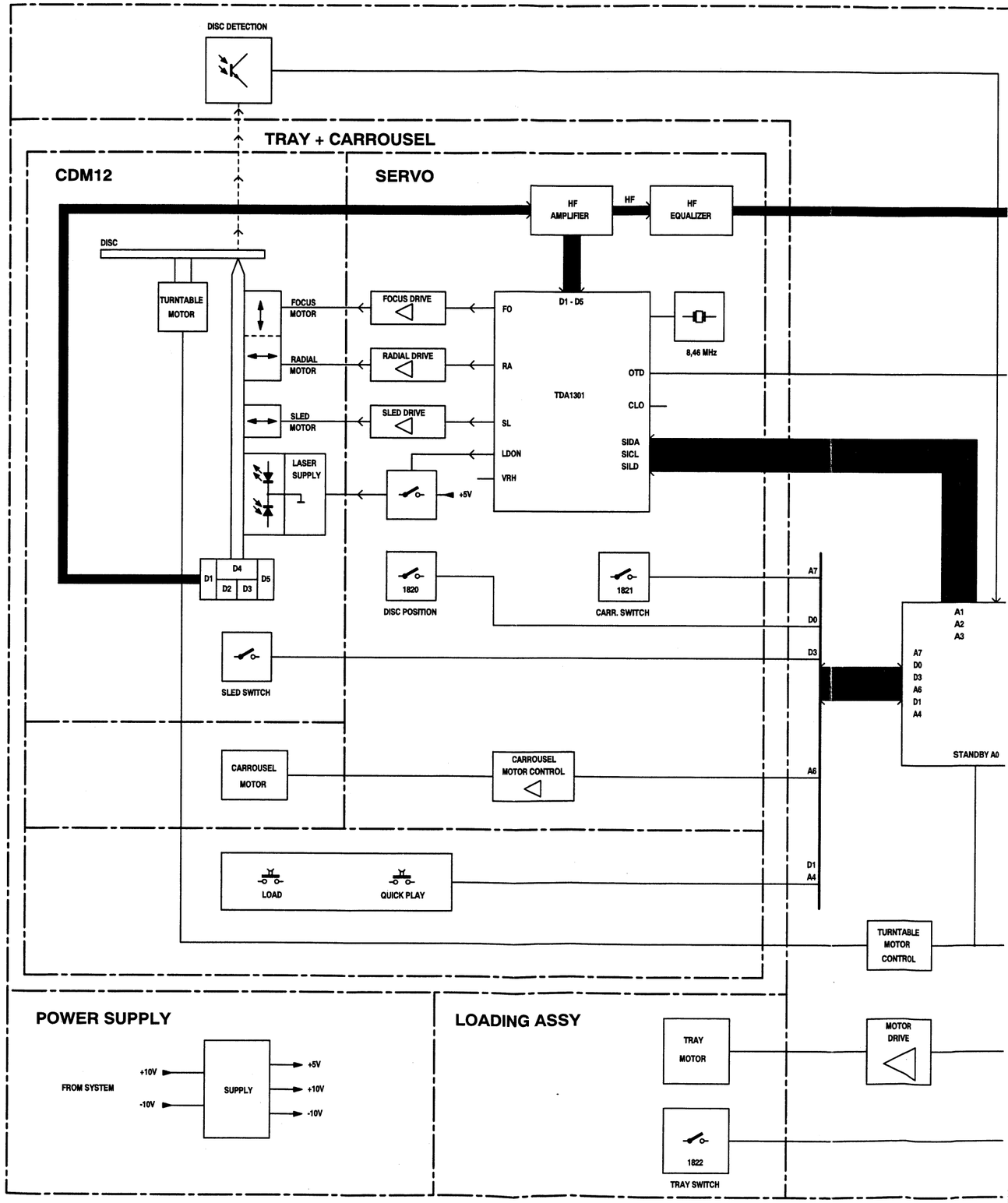
↕ repeat

FAULT FINDING TREE - CD PART

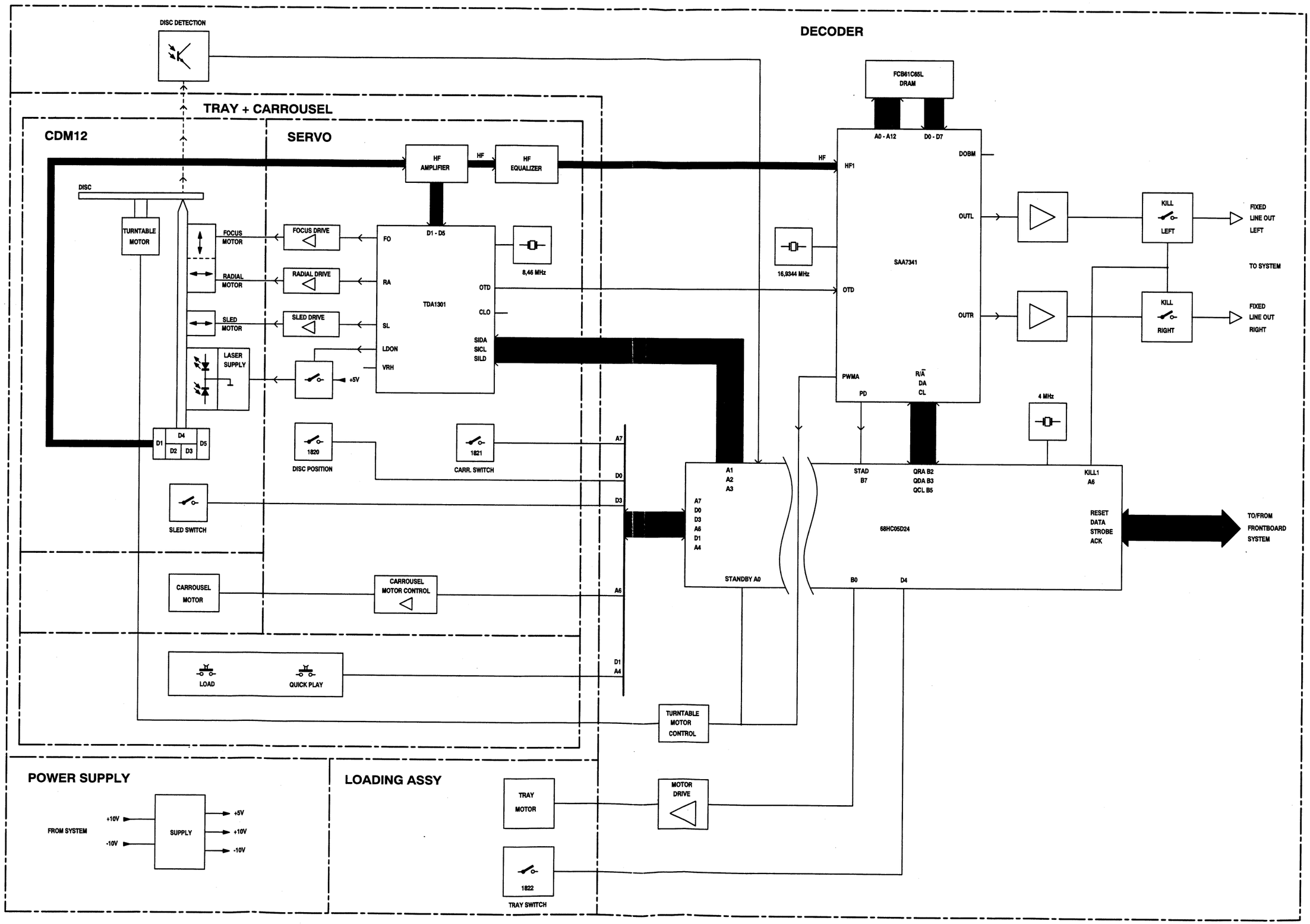


HAS1112
9316

BLOCK DIAGRAMM - CD PART

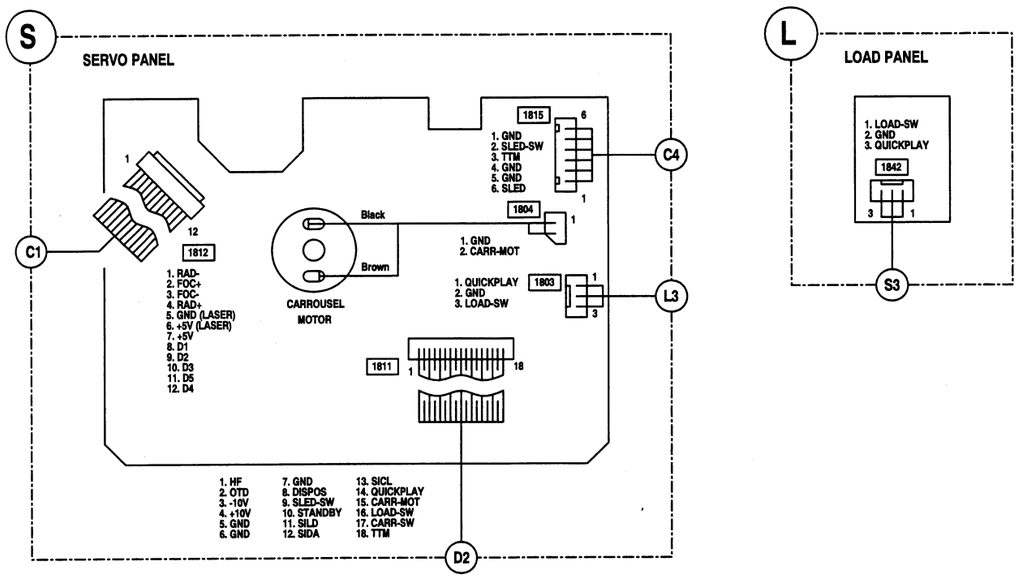


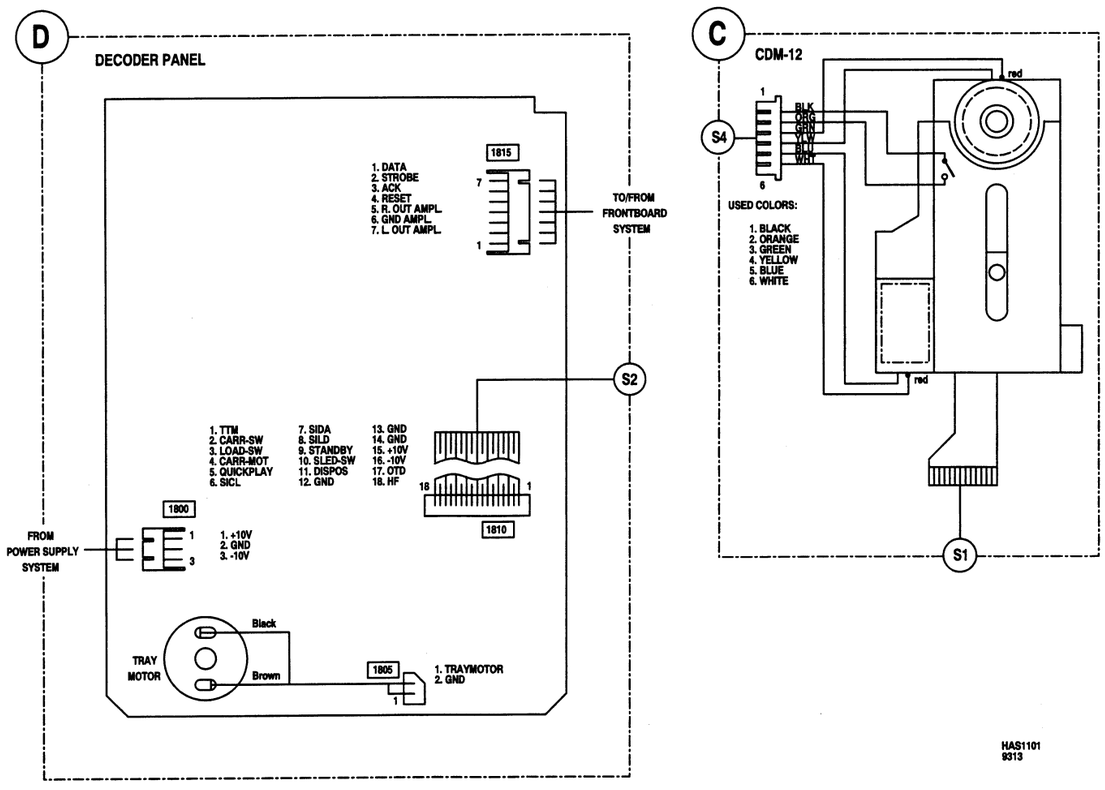
BLOCK DIAGRAMM - CD PART



HAS1102
9314

WIRING DIAGRAM - CD PART





HAS1101
9313

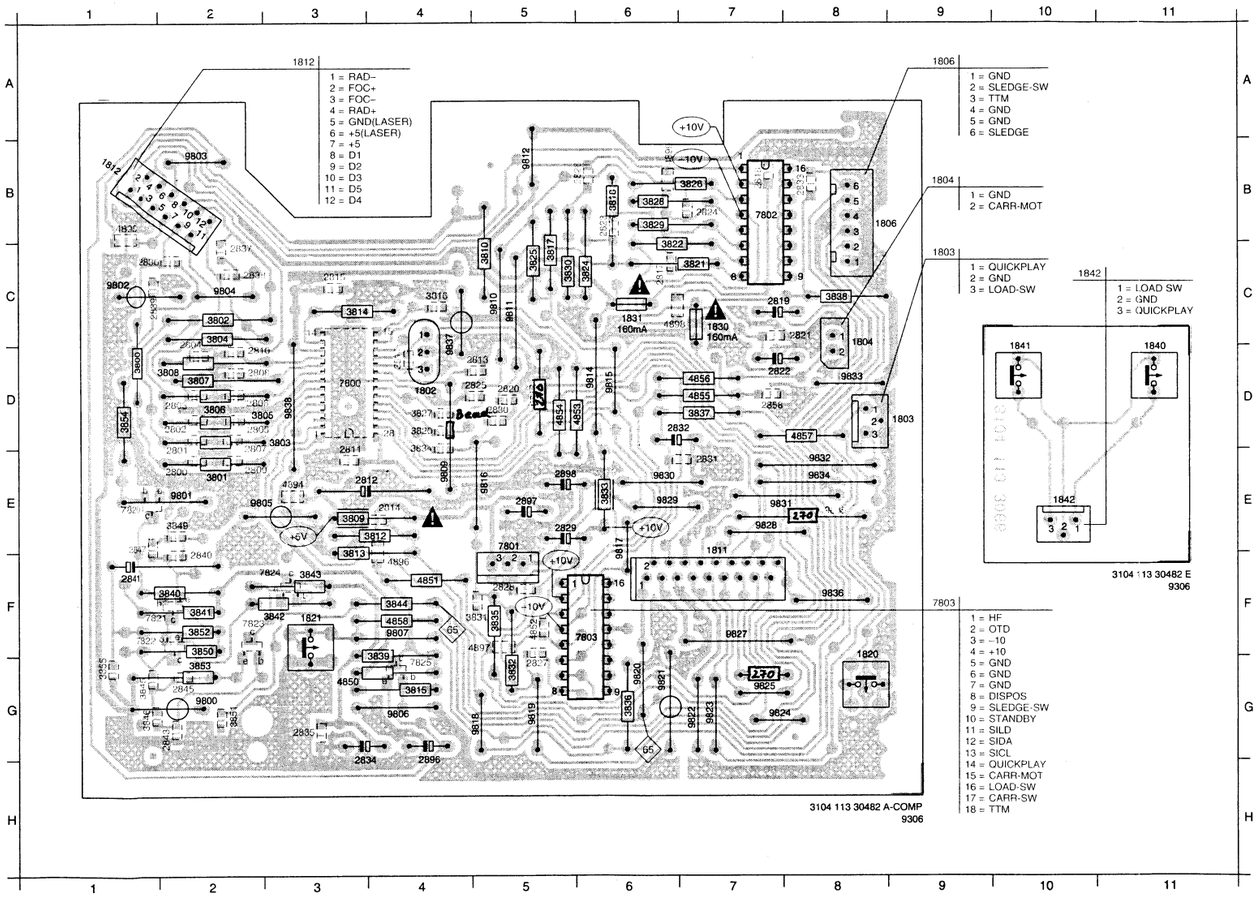
ABBREVIATIONS

A0-A12	: Address outputs to external RAM
AM*	: Additional mute
CFB	: Data slicer feedback output to capacitor
CL	: Microprocessor interface clock input
CLO	: Clock output
D0-D7	: Data inputs/outputs to external RAM
D1-D4	: Central diode signal input
DA	: Microprocessor interface data input/output line
DE1L	: Pin 1 for external de-emphasis capacitor and resistor
DE1R	: Pin 1 for external de-emphasis capacitor and resistor
DE2L	: Pin 2 for external de-emphasis capacitor and resistor
DE2R	: Pin 2 for external de-emphasis capacitor and resistor
DEEM	: Output for external de-emphasis switches
DOBM	: Digital audio output
FO	: Focus actuator output
HFD	: High frequency detector
HFI*	: Inverting data slicer input
HFI	: Non-inverting data slicer input
HM	: Motor control signal
IREF	: Current reference output
KO*	: Kill out
KTC	: Kill time capacitor connection
LDON	: Laser drive on
MACC	: Motor accelerate signal
MBRA	: Motor brake signal
MHAL	: Hall effect detector for motor
NRST	: Reset input
OC	: VCO control
OTD	: Off track detector
OUTL	: Left channel output
OUTR	: Right channel output
PD	: Phase detector
PWMA	: Pulse width modulated motor control acceleration
PWMB	: Pulse width modulated motor brake signal
R/A	: Request/acknowledge
SD1-5	: Photodiode signals
SICL	: Serial interface clock
SIDA	: Serial interface data
SILD	: Serial interface load
SL	: Sledge output
ST*	: Standby mode
TS1-TS2	: Test input
VddA	: Power supply analog part
VddD	: Power supply digital part
VRH	: Reference input for A/D converter
VRL	: Reference input for A/D converter
VssA	: Ground analog part
VssD	: Ground digital part
WE	: Write enable
XIN	: Crystal oscillator input
XOUT	: Output to clock crystal
XTLI	: Oscillator input
XTLO	: Oscillator output
XTLR	: Oscillator reference

* log. 0-active !

SERVO PANEL COMPONENT SIDE
LOAD PANEL

1802	D4	1841	D10	2809	E2	2821	C8	2832	D6	2845	G2	3806	D2	3817	C5	3830	C5	3841	F2	3853	G2	4858	F4	7820	E1	9805	E2	9817	F6	9828	E7
1803	D9	1842	E10	2810	D2	2822	D7	2833	B8	2858	D7	3807	D2	3818	B6	3831	F4	3842	F2	3854	D1	4894	E3	7821	F1	9806	G4	9818	G5	9829	E6
1804	D8	2800	E2	2811	E3	2823	B6	2834	H3	2896	H4	3808	D1	3820	D4	3832	G5	3843	F3	3855	G1	4895	B1	7822	F1	9807	F4	9819	G5	9830	E6
1806	B8	2801	E2	2812	E3	2824	B7	2835	G3	2897	E5	3809	E3	3821	C7	3833	E6	3844	F4	4850	G3	4896	F4	7823	F2	9809	E4	9820	G6	9831	E7
1811	F7	2802	D2	2813	D4	2825	D4	2836	C1	2898	E5	3810	C5	3822	C6	3834	E4	3845	G1	4851	F4	4897	F4	7824	F2	9810	C5	9821	G6	9832	E8
1812	B1	2803	D2	2814	E4	2826	B6	2837	C2	3800	D1	3811	D4	3824	C6	3835	F5	3846	G1	4852	F5	4898	C6	7825	G4	9811	C5	9822	G7	9833	D8
1820	G8	2804	D2	2815	C3	2827	G5	2838	C2	3801	E2	3812	E3	3825	C5	3836	G6	3847	F1	4853	D6	4899	B6	9800	G2	9812	B5	9823	G7	9834	E8
1821	F3	2805	D2	2817	C6	2828	F5	2839	C1	3802	C2	3813	F3	3826	B7	3837	D7	3849	E2	4854	D5	7800	D3	9801	E2	9813	D5	9824	G7	9835	E8
1830	C7	2806	D2	2818	B7	2829	E5	2840	F2	3803	D3	3814	C3	3827	D4	3838	C8	3850	F2	4855	D7	7801	E5	9802	C1	9814	D6	9825	G7	9836	F8
1831	C6	2807	E2	2819	C7	2830	D5	2841	F1	3804	C2	3815	G4	3828	B6	3839	G3	3851	G2	4856	D7	7802	B7	9803	B2	9815	D6	9826	G7	9837	D4
1840	D11	2808	D2	2820	D5	2831	E7	2843	G2	3805	D2	3816	C4	3829	B6	3840	F1	3852	F2	4857	D8	7803	F5	9804	C2	9816	E5	9827	F7	9838	D3



SERVO PANEL SOLDER SIDE

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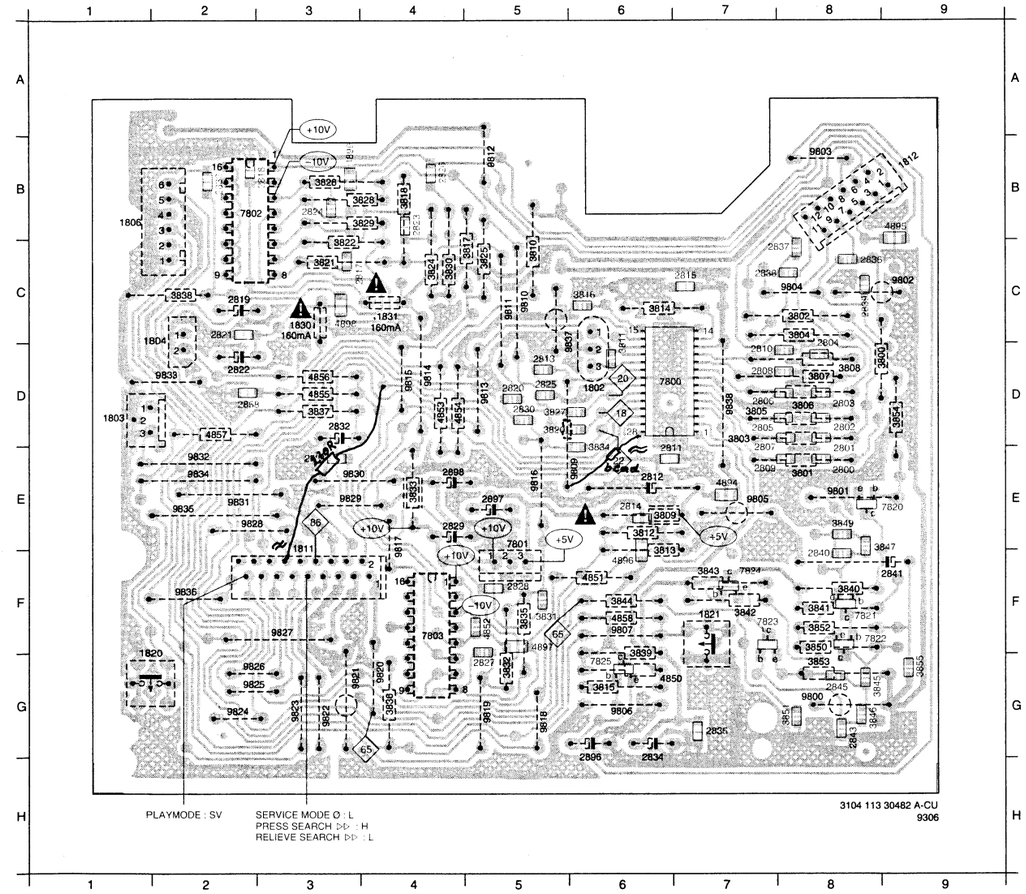
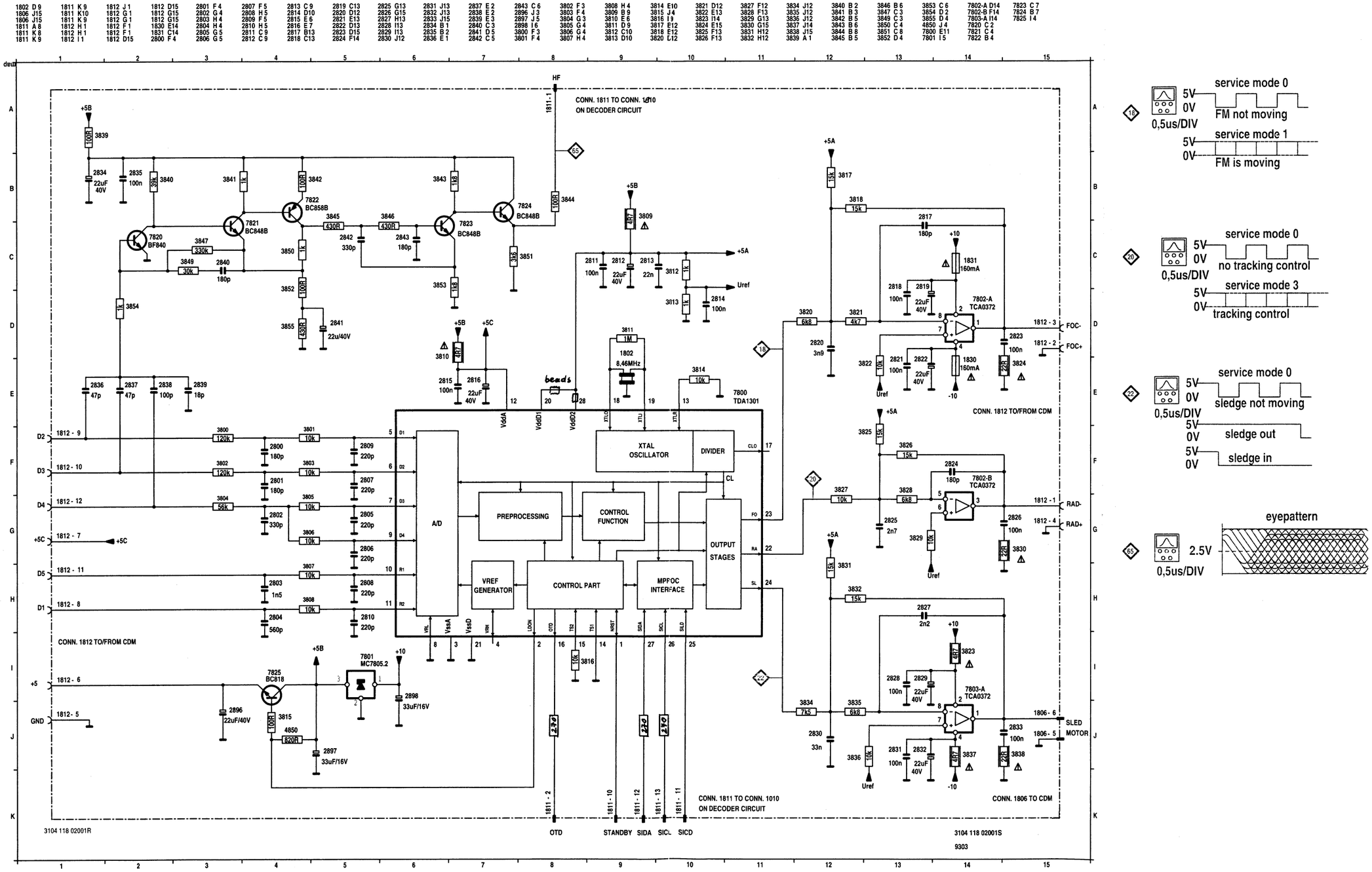
1803	D1	2805	D7	2820	D5	2834	H6	3800	D9	3814	C6	3830	C4	3844	F6	4853	D4	7802	B2	9806	G6	9821	G3	9835	E2		
1804	D1	2806	D7	2821	C2	2835	G7	3801	E8	3815	G6	3831	F5	3845	G8	4854	D4	7803	F4	9807	F6	9822	G3	9836	F2		
1806	B1	2807	E7	2822	D2	2836	C8	3802	C8	3816	C6	3832	G5	3846	G8	4855	D3	7820	E8	9809	E6	9823	G3	9837	D6		
1811	F3	2808	D7	2823	B4	2837	C7	3803	D7	3817	C5	3833	E4	3847	F8	4856	D3	7821	F8	9810	C5	9824	G2	9838	D7		
1812	B9	2809	E7	2824	B3	2838	C7	3804	C8	3818	B4	3834	E6	3849	E8	4857	D2	7822	F8	9811	C5	9825	G2				
1820	G1	2810	D7	2825	D5	2839	C8	3805	D7	3820	D5	3835	F5	3850	F8	4858	F6	7823	F7	9812	B5	9826	G2				
1821	F7	2811	E6	2826	B4	2840	F8	3806	D8	3821	C3	3836	G4	3851	G8	4894	E7	7824	F7	9813	D5	9827	F3				
1830	C3	2812	E6	2827	G5	2841	F8	3807	D8	3822	C3	3837	D3	3852	F8	4895	B9	7825	G6	9814	D4	9828	E2				
1831	C4	2813	D5	2828	F5	2843	G8	3808	D8	3824	C4	3838	C2	3853	G8	4896	F6	9800	G8	9815	D4	9829	E3				
2800	E8	2814	E6	2829	E4	2845	G8	3809	E6	3825	C5	3839	G6	3854	D9	4897	F5	9801	E8	9816	E5	9830	E3				
2801	E8	2815	C7	2830	D5	2858	D2	3810	C5	3826	B3	3840	F8	3855	G9	4898	C3	9802	C9	9817	F4	9831	E2				
2802	D8	2817	C4	2831	E3	2896	H6	3811	D6	3827	D5	3841	F8	4850	G6	4899	B3	9803	B8	9818	G5	9832	E2				
2803	D8	2818	B3	2832	D3	2897	E5	3812	E6	3828	B3	3842	F7	4851	F6	7800	D6	9804	C8	9819	G5	9833	D2				



SERVO CIRCUIT DIAGRAM
SERVO-1



1800	I1	2853	B2	2874	D5	2890	H5	3862	C2	3880	D6	3896	D7	4808	C6	4825	E2	4842	F4	4885	J5	7828	B4	9851	F7	9867	F4	9887	J7
1801	D5	2854	C3	2875	C4	2891	F3	3863	E2	3881	D6	3897	D8	4809	J5	4826	D1	4843	H9	4886	J4	7829	B5	9852	F7	9868	F2	9888	G8
1805	L7	2855	B2	2876	E6	2892	F3	3864	D4	3882	A4	3898	C8	4810	J6	4827	F9	4847	K4	4888	J5	7830	B6	9853	F7	9869	I3	9889	F8
1810	H8	2859	E4	2877	B4	2893	G3	3865	D5	3883	A4	3899	C7	4811	E8	4828	G6	4848	I8	4889	J4	7831	F8	9854	F4	9870	B5	9891	I6
1815	C9	2860	B5	2878	A5	2894	G3	3866	B5	3884	E6	3901	K5	4812	F8	4829	H5	4849	I8	6800	C2	7832	G3	9855	G8	9872	G7	9892	I6
1822	G2	2861	C5	2879	E8	2895	H3	3867	C5	3885	E7	3905	K5	4814	I8	4830	F5	4859	H5	6801	C7	9840	D4	9856	I3	9873	F5	9893	J6
1840	K5	2862	E5	2880	E6	2902	E4	3868	F5	3886	B4	3906	K5	4815	G9	4831	F5	4860	D8	6802	F9	9841	E5	9857	I3	9874	D7	9894	J6
2844	B3	2863	E4	2881	E7	2905	D8	3869	G5	3887	D6	3907	K5	4816	G6	4832	G6	4861	D6	7804	E2	9842	C5	9858	I7	9875	I4	9896	E8
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2846	D2	2865	H4	2883	D8	2907	E8	3873	F3	3889	B5	4801	E7	4818	J5	4834	G4	4863	C3	7806	J4	9844	F7	9860	F7	9877	F2	9899	H3
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2849	C4	2870	C4	2886	K6	3857	C3	3876	H4	3892	F6	4804	D8	4821	F8	4837	G2	4878	J5	7809	D8	9847	I3	9863	F5	9880	E3		
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2851	B3	2872	C4	2888	H5	3860	C1	3878	C5	3894	D7	4806	C6	4823	J6	4840	I9	4882	C4	7826	F4	9849	I8	9865	H3	9885	B3		
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1805	L4	2856	E6	2878	A5	2895	H7	3868	F6	3887	D5	4800	C4	4818	J6	4835	H5	4877	K5	7809	D3	9848	F4	9865	H8	9886	B7
1810	H2	2860	B6	2879	E3	2902	E7	3869	G5	3888	D4	4801	E3	4819	J3	4836	G8	4878	J5	7810	G7	9849	I2	9866	G2	9887	J3
1815	C2	2861	C5	2880	E4	2905	D3	3871	H6	3889	B5	4802	E2	4820	K4	4837	G8	4881	C8	7826	F7	9850	G3	9867	F6	9888	G2
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1840	K5	2863	E6	2882	C3	2907	E2	3874	G7	3891	F4	4804	D2	4822	F2	4840	I2	4883	E5	7828	B6	9852	F3	9869	I7	9891	I4
2844	B8	2864	G5	2883	D3	3848	I5	3875	F7	3892	F4	4805	E3	4823	J5	4841	G2	4885	J6	7829	B5	9853	F4	9870	B6	9892	I4
2845	C7	2865	H6	2884	E3	3856	B8	3876	H6	3893	C4	4806	C4	4824	E9	4842	F6	4886	J6	7830	B5	9854	F7	9872	G4	9893	J4
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2847	D9	2869	E5	2886	K4	3858	B6	3878	C5	3895	C4	4808	C4	4826	D9	4847	K7	4889	J7	7832	G7	9856	I7	9874	D3	9896	E2
2848	B7	2870	C6	2887	J4	3860	C9	3879	D5	3896	D4	4809	J6	4827	F1	4848	I3	6800	C8	9840	D6	9857	I7	9875	I6	9898	F1
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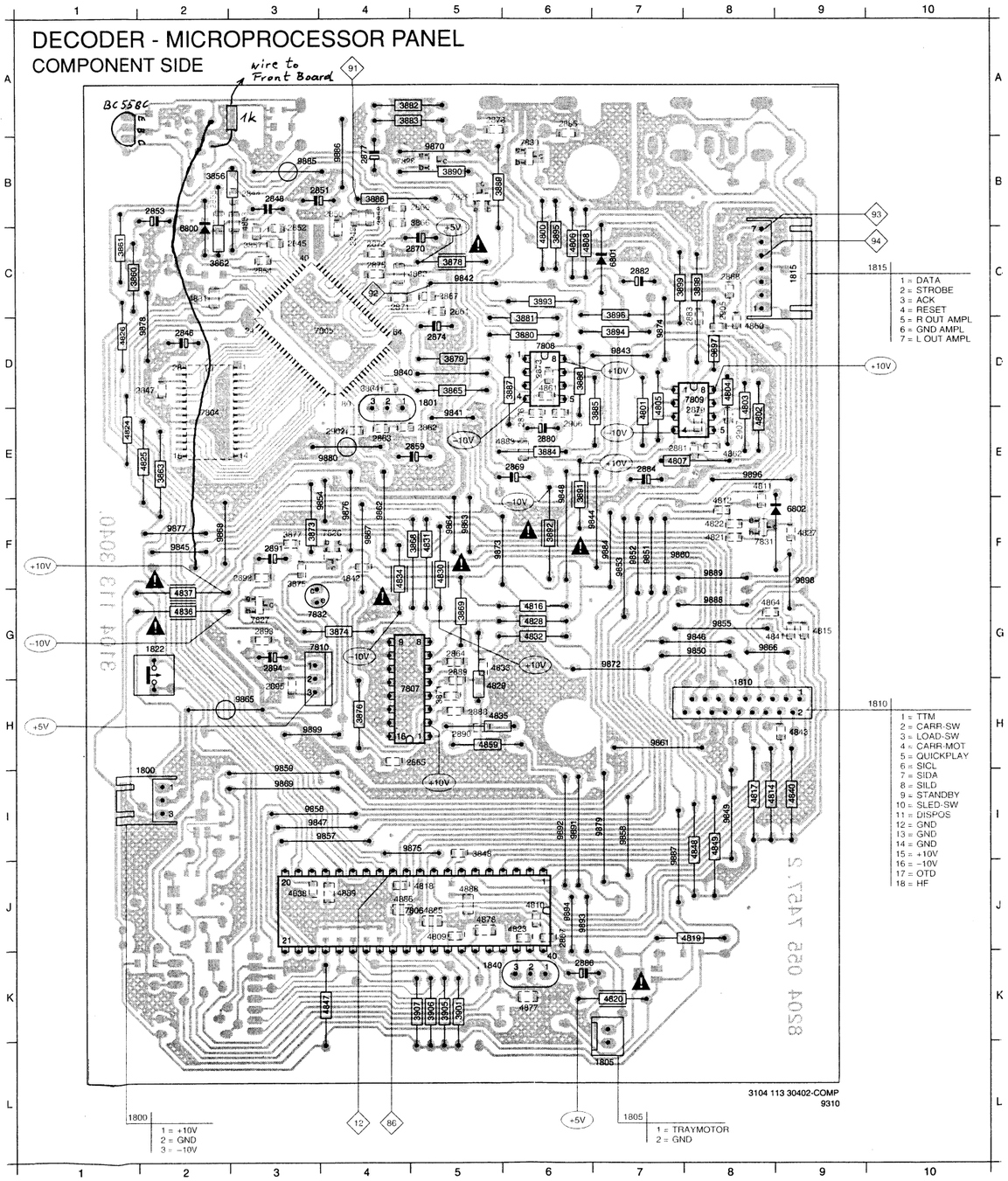
2850	B7	2872	C6	2889	G5	3862	C8	3881	D5	3898	C3	4811	E2	4829	H5	4859	H5	6802	F2	9842	C5	9859	I7	9877	F8		
2851	B7	2873	D5	2890	H5	3863	E9	3882	A6	3899	C3	4812	F2	4830	F6	4860	D2	7804	E8	9843	D3	9860	F3	9878	D9		
2852	C7	2874	D6	2891	F7	3864	D6	3883	A6	3901	K5	4814	I2	4831	F6	4861	D4	7805	D7	9844	F4	9861	H3	9879	I4		
2853	B9	2875	C6	2892	F8	3865	D5	3884	E4	3905	K6	4815	G1	4832	G4	4862	E2	7806	J6	9845	F8	9862	F6	9880	E7		

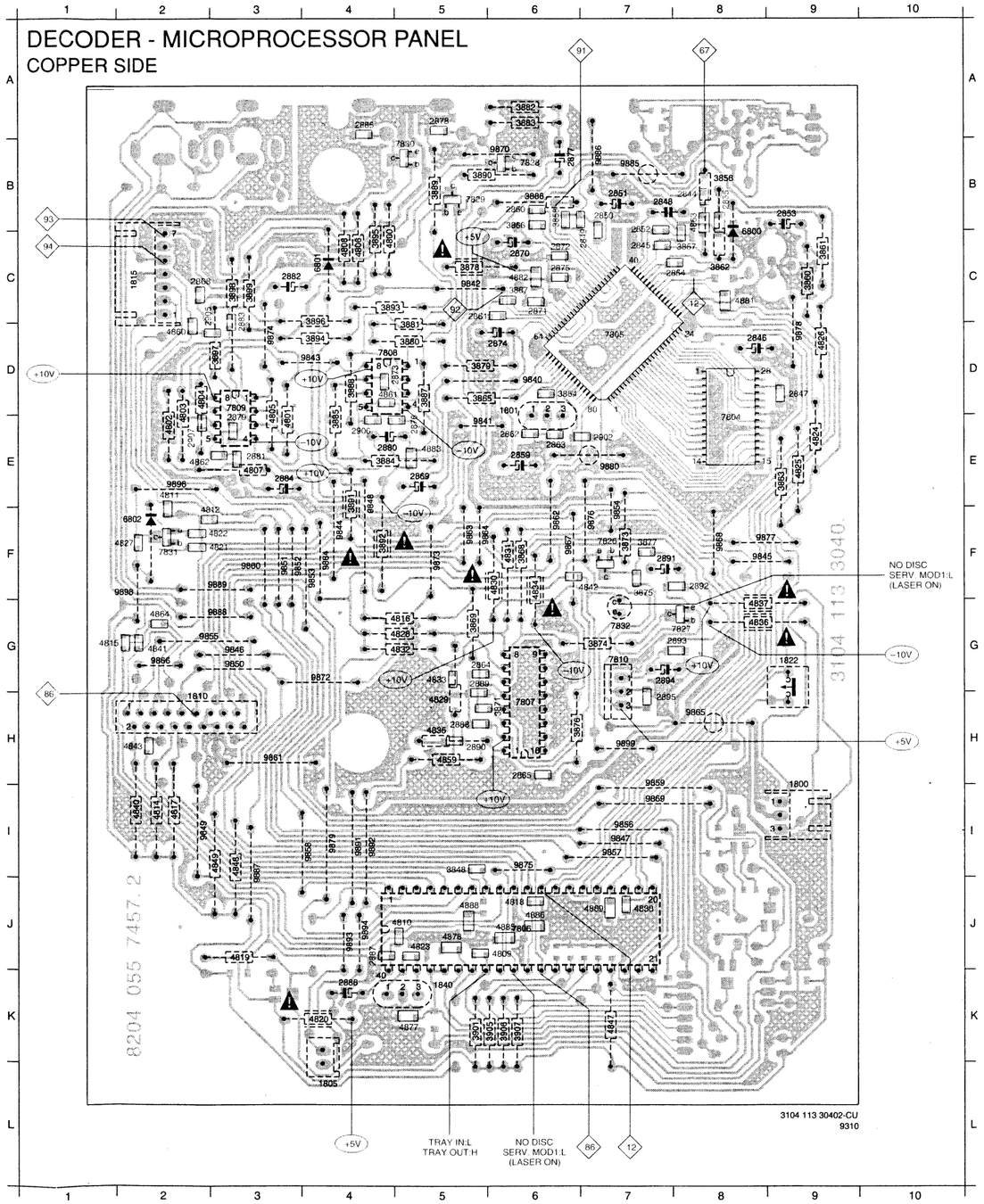
DECODER - MICROPROCESSOR PANEL

COMPONENT SIDE

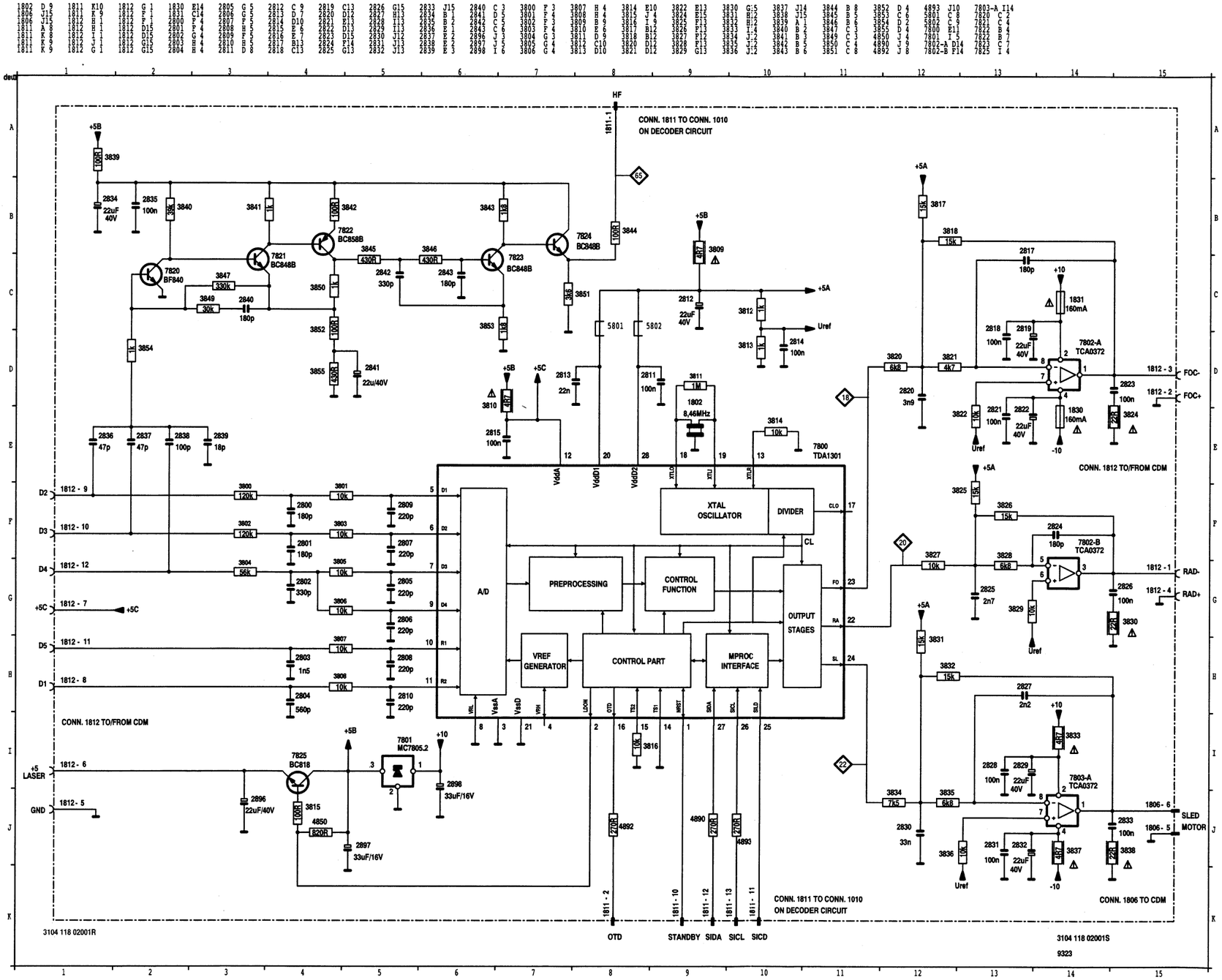


DECODER - MICROPROCESSOR PANEL

COPPER SIDE



SERVO CIRCUIT DIAGRAM



service mode 0
5V
0V
FM not moving
0,5us/DIV
service mode 1
5V
0V
FM is moving

service mode 0
5V
0V
no tracking control
0,5us/DIV
service mode 3
5V
0V
tracking control

service mode 0
5V
0V
sledge not moving
0,5us/DIV
5V
0V
sledge out
5V
0V
sledge in

eyepattern
2.5V
0,5us/DIV

900	I1	2853	B2	2874	D5	2890	H5	3862	C2	3880	D6	3896	D7	4808	C6	4825	E2	4842	F4	4885	J5	7828	B4	9851	F7	9867	F4	9887	J7
901	D5	2854	C3	2875	C4	2891	F3	3863	E2	3881	D6	3897	D8	4809	J5	4826	D1	4843	H9	4886	J4	7829	B5	9852	F7	9868	F2	9888	G8
905	L7	2855	B2	2876	E6	2892	F3	3864	D4	3882	A4	3898	C8	4810	J6	4827	F9	4847	K4	4888	J5	7830	B6	9853	F7	9869	I3	9889	F8
910	H8	2859	E4	2877	B4	2893	G3	3865	D5	3883	A4	3899	C7	4811	E8	4828	G6	4848	I8	4889	J4	7831	F8	9854	F4	9870	B5	9891	I6
915	C9	2860	B5	2878	A5	2894	G3	3866	B5	3884	E6	3901	K5	4812	F8	4829	H5	4849	I8	6800	C2	7832	G3	9855	G8	9872	G7	9892	I6
922	G2	2861	C5	2879	E8	2895	H3	3867	C5	3885	E7	3905	K5	4814	I8	4830	F5	4859	H5	6801	C7	9840	D4	9856	I3	9873	F5	9893	J6
940	K5	2862	E5	2880	E6	2902	E4	3868	F5	3886	B4	3906	K5	4815	G9	4831	F5	4860	D8	6802	F9	9841	E5	9857	I3	9874	D7	9894	J6
944	B3	2863	E4	2881	E7	2905	D8	3869	G5	3887	D6	3907	K5	4816	G6	4832	G6	4861	D6	7804	E2	9842	C5	9858	I7	9875	I4	9896	E8
845	C3	2864	G5	2882	C7	2906	E6	3871	H5	3888	D6	4800	C6	4817	I8	4833	G5	4862	E8	7805	D3	9843	D7	9859	I3	9876	F4	9898	F9
846	D2	2865	H4	2883	D8	2907	E8	3873	F3	3889	B5	4801	E7	4818	J5	4834	G4	4863	C3	7806	J4	9844	F7	9860	F7	9877	F2	9899	H3
847	D1	2868	C8	2884	E7	3848	I5	3874	G4	3890	B5	4802	E8	4819	J7	4835	H5	4864	G8	7807	H4	9845	F2	9861	H7	9878	D2		
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851	B3	2872	C4	2888	H5	3860	C1	3878	C5	3894	D7	4806	C6	4823	J6	4840	I9	4882	C4	7826	F4	9849	I8	9865	H3	9885	B3		
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1801	D6	2855	B8	2877	B6	2894	G7	3867	C6	3886	B6	3907	K6	4817	I2	4834	G6	4864	G2	7808	D4	9847	I7	9864	F6	9885	B7
1805	L4	2859	E6	2878	A5	2895	H7	3868	F6	3887	D5	4800	C4	4818	J6	4835	H5	4877	K5	7809	D3	9848	F4	9865	H8	9886	B7
1810	H2	2860	B6	2879	E3	2902	E7	3869	G5	3888	D4	4801	E3	4819	J3	4836	G8	4878	J5	7810	G7	9849	I2	9866	G2	9887	J3
1815	C2	2861	C5	2880	E4	2905	D3	3871	H6	3889	B5	4802	E2	4820	K4	4837	G8	4881	C8	7826	F7	9850	G3	9867	F6	9888	G2
1822	G9	2862	E6	2881	E3	2906	E4	3873	F7	3890	B5	4803	E2	4821	F2	4838	J7	4882	C6	7827	G7	9851	F3	9868	F8	9889	F2
1840	K5	2863	E6	2882	C3	2907	E2	3874	G7	3891	F4	4804	D2	4822	F2	4840	I2	4883	E5	7828	B6	9852	F3	9869	I7	9891	I4
2844	B8	2864	G5	2883	D3	3848	I5	3875	F7	3892	F4	4805	E3	4823	J5	4841	G2	4885	J6	7829	B5	9853	F4	9870	B6	9892	I4
2845	C7	2865	H6	2884	E3	3856	B8	3876	H6	3893	C4	4806	C4	4824	E9	4842	F6	4886	J6	7830	B5	9854	F7	9872	G4	9893	J4
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2848	B7	2870	C6	2887	J4	3860	C9	3879	D5	3896	D4	4809	J6	4827	F1	4848	I3	6800	C8	9840	D6	9857	I7	9875	I6	9898	F1
2849	C7	2871	C6	2888	H5	3861	C9	3880	D5	3897	D3	4810	J4	4828	G4	4849	I3	6801	C4	9841	E5	9858	I4	9876	F7	9899	H7
2850	B7	2872	C6	2889	G5	3862	C8	3881	D5	3898	C3	4811	E2	4829	H5	4859	H5	6802	F2	9842	C5	9859	I7	9877	F8		
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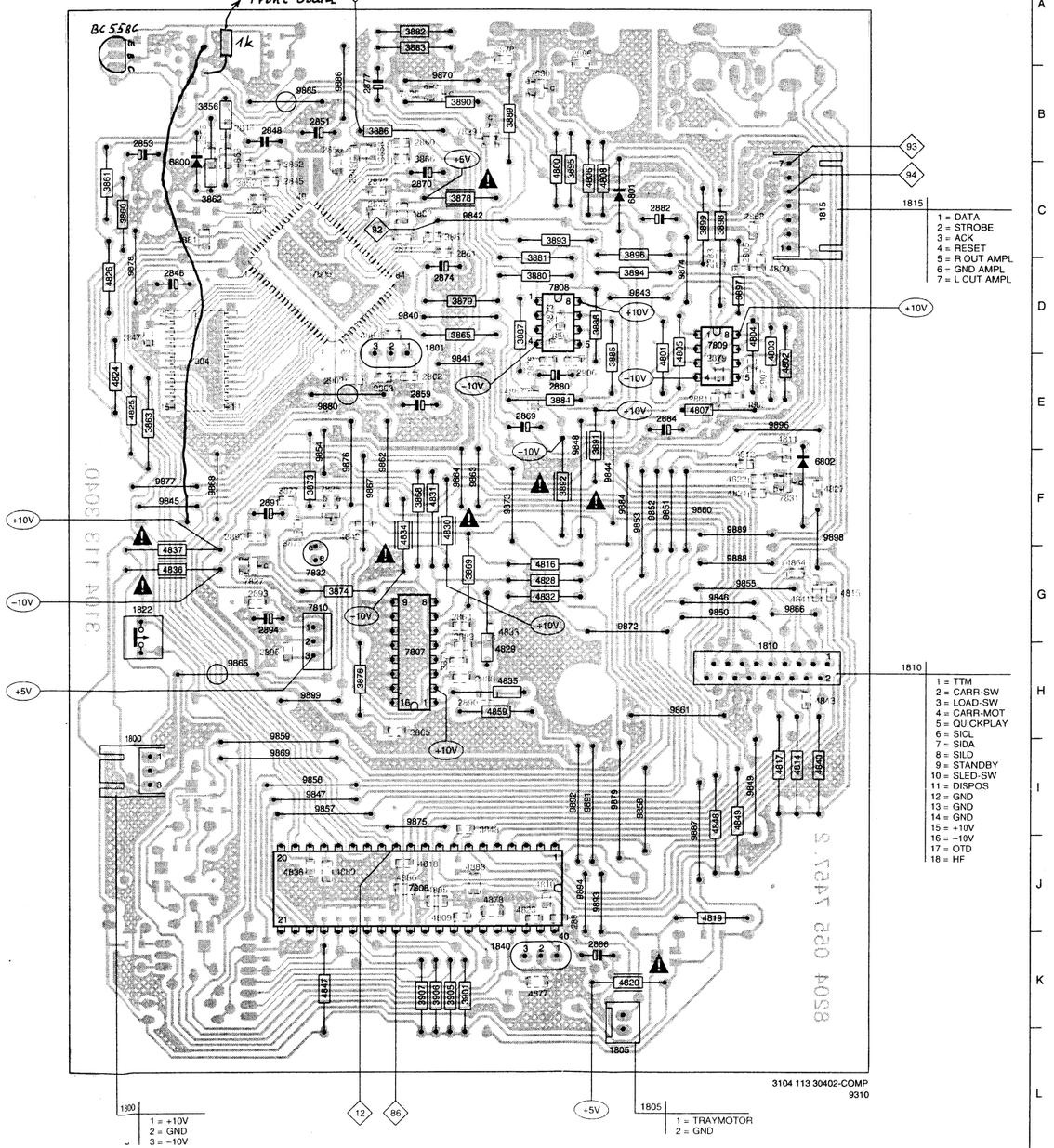
2852	C7	2874	D6	2891	F7	3864	D6	3883	A6	3901	K5	4814	I2	4831	F6	4861	D4	7805	D7	9844	F4	9861	H3	9879	I4		
2853	B9	2875	C6	2892	F8	3865	D5	3884	E4	3905	K6	4815	G1	4832	G4	4862	E2	7806	J6	9845	F8	9862	F6	9880	E7		

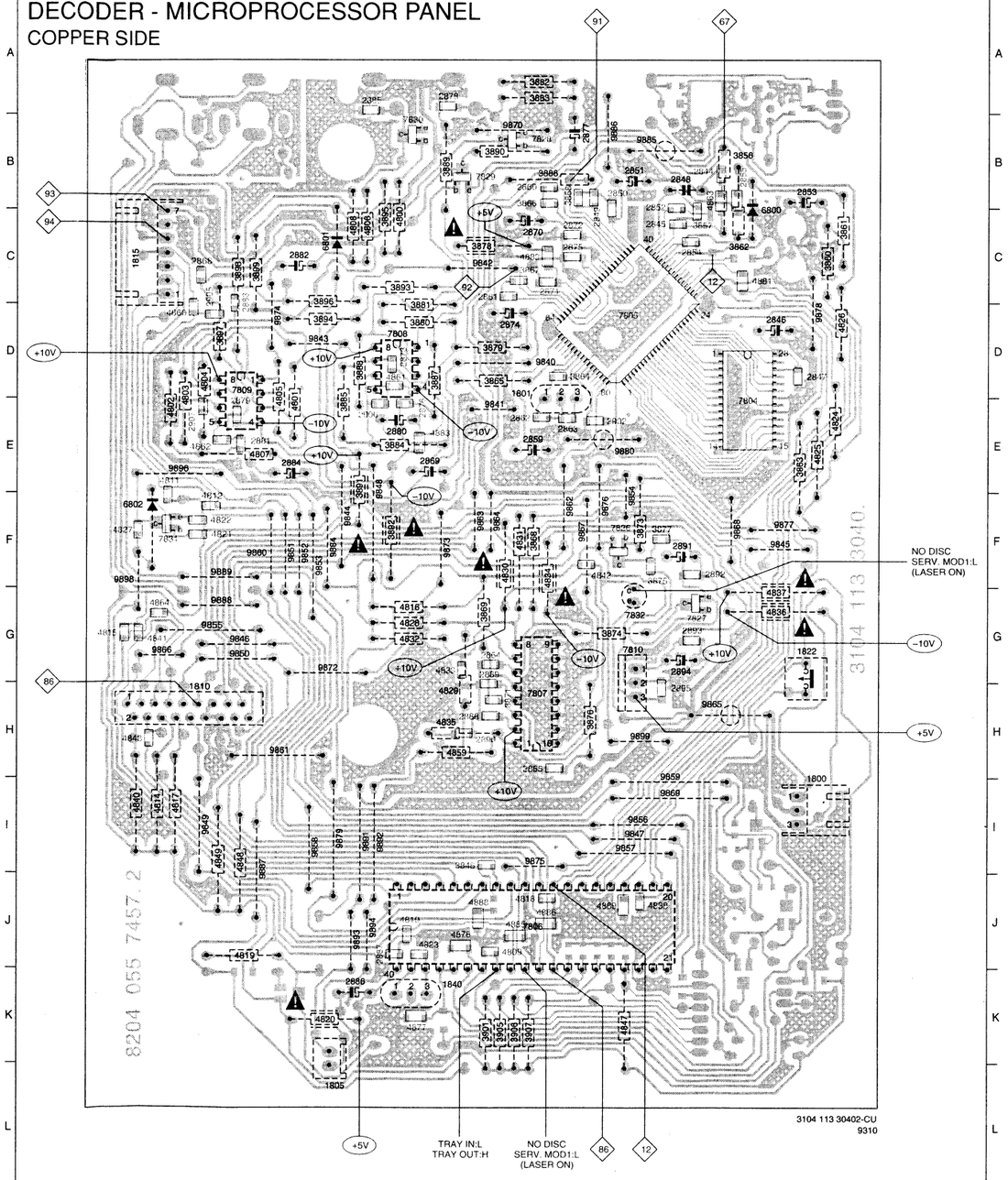
DECODER - MICROPROCESSOR PANEL

COMPONENT SIDE



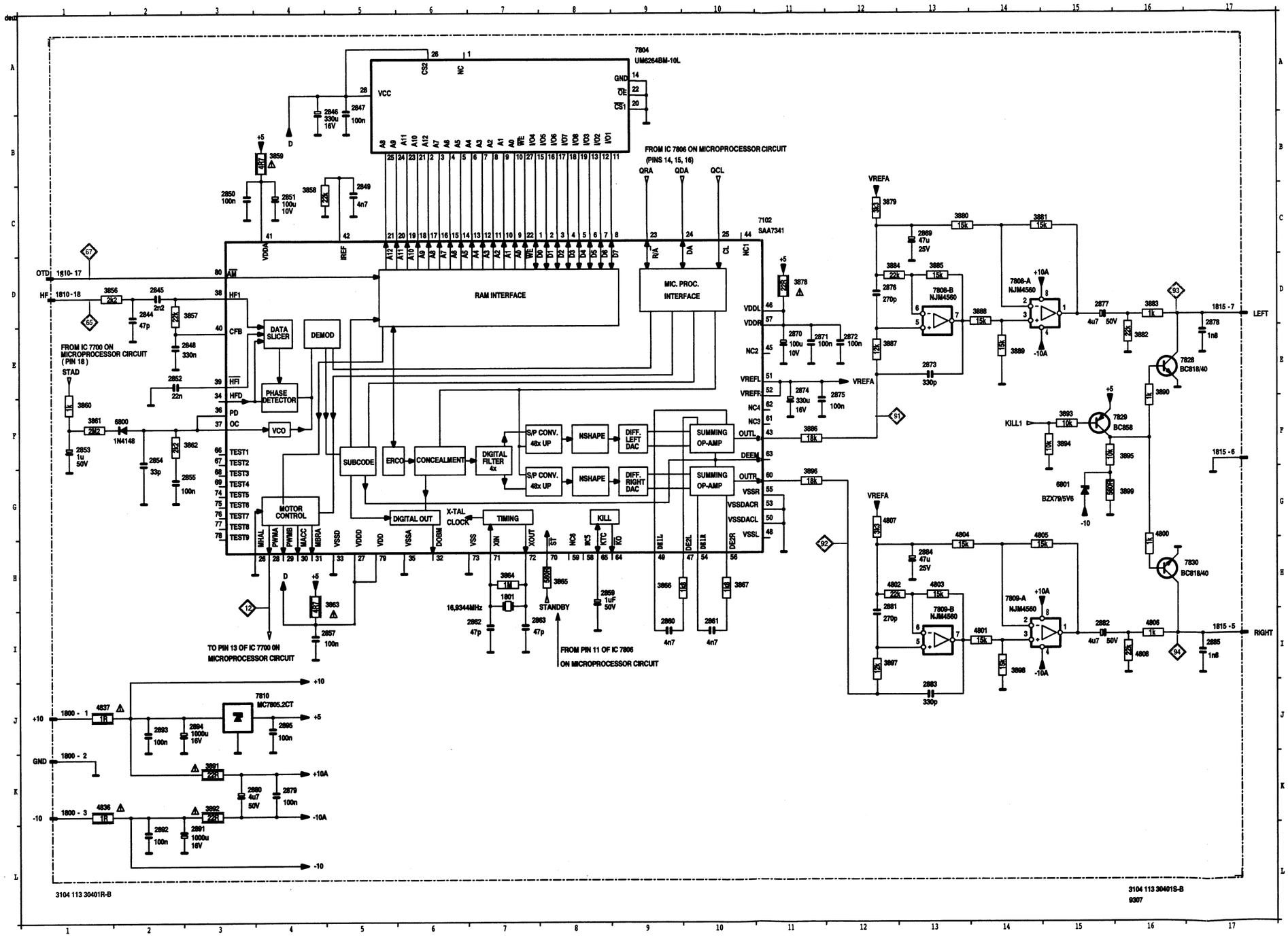
DECODER - MICROPROCESSOR PANEL

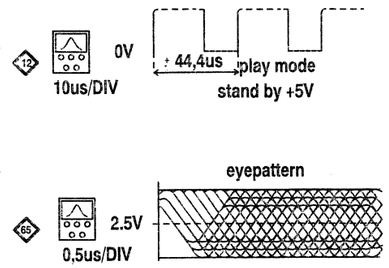
COPPER SIDE



DECODER CIRCUIT

1010	D 1	1810	D 1	2845	D 2	2850	C 3	2855	G 2	2862	I 7	2872	E12	2877	D15	2882	I15	2892	L 2	3856	D 1	3861	F 1	3866	H 9	3881	C14	3886	F11	3891	K 3	3896	G11	4801	I14	4806	I16	6800	F 2	7808-B	D13	7829	F15
1800	J 1	1815	I17	2846	A 4	2851	G 4	2857	H 6	2863	I 7	2873	E13	2878	F17	2883	J13	2893	J 2	3857	D 3	3862	F 3	3867	G10	3882	E16	3887	B12	3892	K 3	3897	I12	4802	E12	4807	G13	6801	G15	7809-A	H14	7830	H16
1800	K 1	1815	I17	2847	A 5	2852	F 2	2859	H 6	2869	C13	2874	E17	2879	K 4	2884	H13	2894	J 3	3858	B 4	3863	H 5	3878	D11	3883	D16	3888	D14	3893	F15	3898	I14	4803	H13	4808	I16	7102	C11	7809-B	I13		
1800	K 1	1815	D17	2848	E 2	2853	F 1	2860	I 9	2870	E11	2875	F12	2880	K 3	2885	I17	2895	J 4	3859	B 4	3864	H 7	3879	C12	3884	D12	3889	E14	3894	F15	3899	G16	4804	G13	4836	R 1	7804	A 9	7810	J 4		
1801	H 7	2844	D 2	2849	B 5	2854	F 2	2861	I10	2871	E11	2876	D12	2881	I12	2891	L 3	2902	I 5	3860	F 1	3865	H 8	3880	C13	3885	D13	3890	E16	3895	F16	4800	G16	4805	H14	4837	J 1	7808-A	D14	7828	B16		





SERVICE POSITION 0, 1, 2: 0V
SERVICE POSTION 3: 5V

ANALOG SIGNAL

ANALOG SIGNAL

ANALOG SIGNAL

ANALOG SIGNAL

1800	I1	2853	B2	2874	D5	2890	H5	3862	C2	3880	D6	3896	D7	4808	C6	4825	E2	4842	F4	4885	J5	7828	B4	9851	F7	9867	F4	9887	J7
1801	D5	2854	C3	2875	C4	2891	F3	3863	E2	3881	D6	3897	D8	4809	J5	4826	D1	4843	H9	4886	J4	7829	B5	9852	F7	9868	F2	9888	G8
1805	L7	2855	B2	2876	E6	2892	F3	3864	D4	3882	A4	3898	C8	4810	J6	4827	F9	4847	K4	4888	J5	7830	B6	9853	F7	9869	I3	9889	F8
1810	H8	2859	E4	2877	B4	2893	G3	3865	D5	3883	A4	3899	C7	4811	E8	4828	G6	4848	I8	4889	J4	7831	F8	9854	F4	9870	B5	9891	I6
1815	C9	2860	B5	2878	A5	2894	G3	3866	B5	3884	E6	3901	K5	4812	F8	4829	H5	4849	I8	6800	C2	7832	G3	9855	G8	9872	G7	9892	I6
1822	G2	2861	C5	2879	E8	2895	H3	3867	C5	3885	E7	3905	K5	4814	I8	4830	F5	4859	H5	6801	C7	9840	D4	9856	I3	9873	F5	9893	J6
1840	K5	2862	E5	2880	E6	2902	E4	3868	F5	3886	B4	3906	K5	4815	G9	4831	F5	4860	D8	6802	F9	9841	E5	9857	I3	9874	D7	9894	J6
2844	B3	2863	E4	2881	E7	2905	D8	3869	G5	3887	D6	3907	K5	4816	G6	4832	G6	4861	D6	7804	E2	9842	C5	9858	I7	9875	I4	9896	E8
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2847	D1	2868	C8	2884	E7	3848	I5	3874	G4	3890	B5	4802	E8	4819	J7	4835	H5	4864	G8	7807	H4	9845	F2	9861	H7	9878	D2		
2848	B3	2869	E6	2885	A6	3856	B2	3875	F3	3891	F6	4803	E8	4820	K7	4836	G2	4877	K6	7808	D6	9846	G8	9862	F4	9879	I7		
2849	C4	2870	C4	2886	K6	3857	C3	3876	H4	3892	F6	4804	D8	4821	F8	4837	G2	4878	J5	7809	D8	9847	I3	9863	F5	9880	E3		
2850	B4	2871	C4	2887	J6	3858	B4	3877	F3	3893	C6	4805	E7	4822	F8	4838	J3	4881	C2	7810	G3	9848	F6	9864	F5	9884	F7		
2851	B3	2872	C4	2888	H5	3860	C1	3878	C5	3894	D7	4806	C6	4823	J6	4840	I9	4882	C4	7826	F4	9849	I8	9865	H3	9885	B3		
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1800	I9	2854	C7	2876	E5	2893	G7	3866	B6	3885	E4	3906	K6	4816	G4	4833	G5	4863	C8	7807	H6	9846	G3	9863	F5	9884	F4
1801	D6	2855	B8	2877	B6	2894	G7	3867	C6	3886	B6	3907	K6	4817	I2	4834	G6	4864	G2	7808	D4	9847	I7	9864	F6	9885	B7
1805	L4	2859	E6	2878	A5	2895	H7	3868	F6	3887	D5	4800	C4	4818	J6	4835	H5	4877	K5	7809	D3	9848	F4	9865	H8	9886	B7
1810	H2	2860	B6	2879	E3	2902	E7	3869	G5	3888	D4	4801	E3	4819	J3	4836	G8	4878	J5	7810	G7	9849	I2	9866	G2	9887	J3
1815	C2	2861	C5	2880	E4	2905	D3	3871	H6	3889	B5	4802	E2	4820	K4	4837	G8	4881	C8	7826	F7	9850	G3	9867	F6	9888	G2
1822	G9	2862	E6	2881	E3	2906	E4	3873	F7	3890	B5	4803	E2	4821	F2	4838	J7	4882	C6	7827	G7	9851	F3	9868	F8	9889	F2
1840	K5	2863	E6	2882	C3	2907	E2	3874	G7	3891	F4	4804	D2	4822	F2	4840	I2	4883	E5	7828	B6	9852	F3	9869	I7	9891	I4
2844	B8	2864	G5	2883	D3	3848	I5	3875	F7	3892	F4	4805	E3	4823	J5	4841	G2	4885	J6	7829	B5	9853	F4	9870	B6	9892	I4
2845	C7	2865	H6	2884	E3	3856	B8	3876	H6	3893	C4	4806	C4	4824	E9	4842	F6	4886	J6	7830	B5	9854	F7	9872	G4	9893	J4
2846	D8	2868	C2	2885	A4	3857	C8	3877	F7	3894	D4	4807	E3	4825	E9	4843	H2	4888	J5	7831	F2	9855	G2	9873	F5	9894	J4
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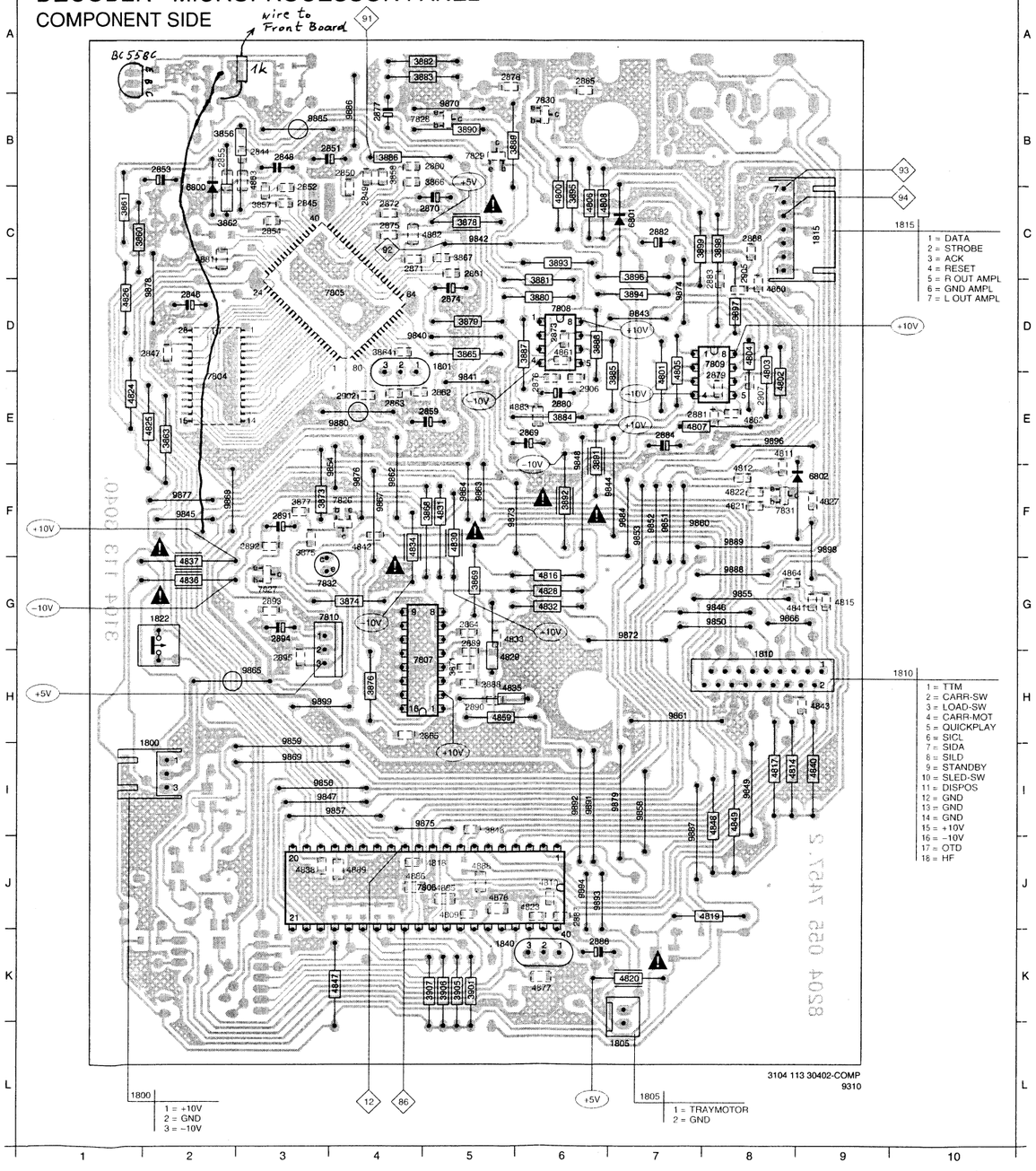
2852	C7	2874	D6	2891	F7	3864	D6	3883	A6	3901	K5	4814	I2	4831	F6	4861	D4	7805	D7	9844	F4	9861	H3	9879	I4		
2853	B9	2875	C6	2892	F8	3865	D5	3884	E4	3905	K6	4815	G1	4832	G4	4862	E2	7806	J6	9845	F8	9862	F6	9880	E7		

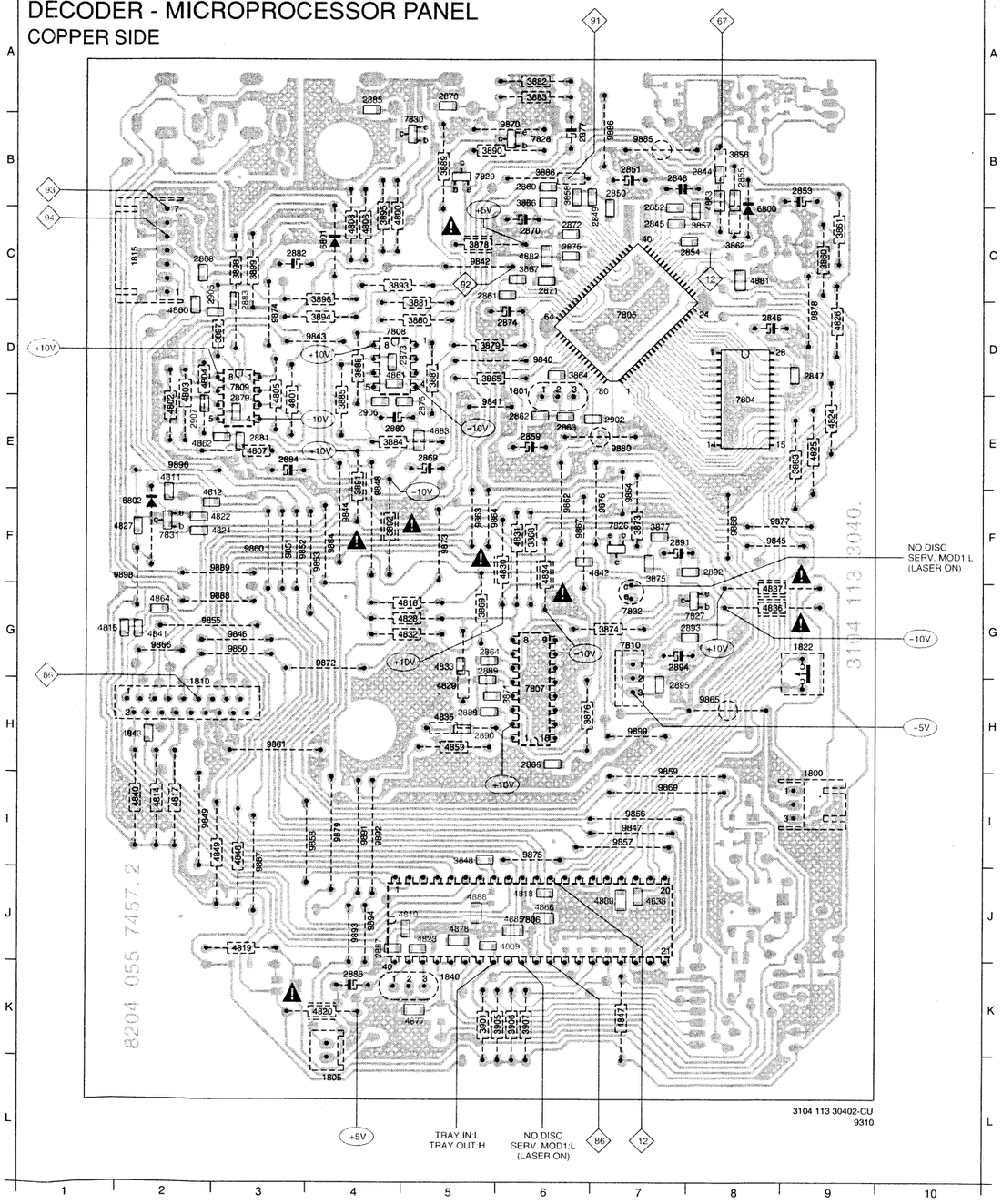
DECODER - MICROPROCESSOR PANEL

COMPONENT SIDE

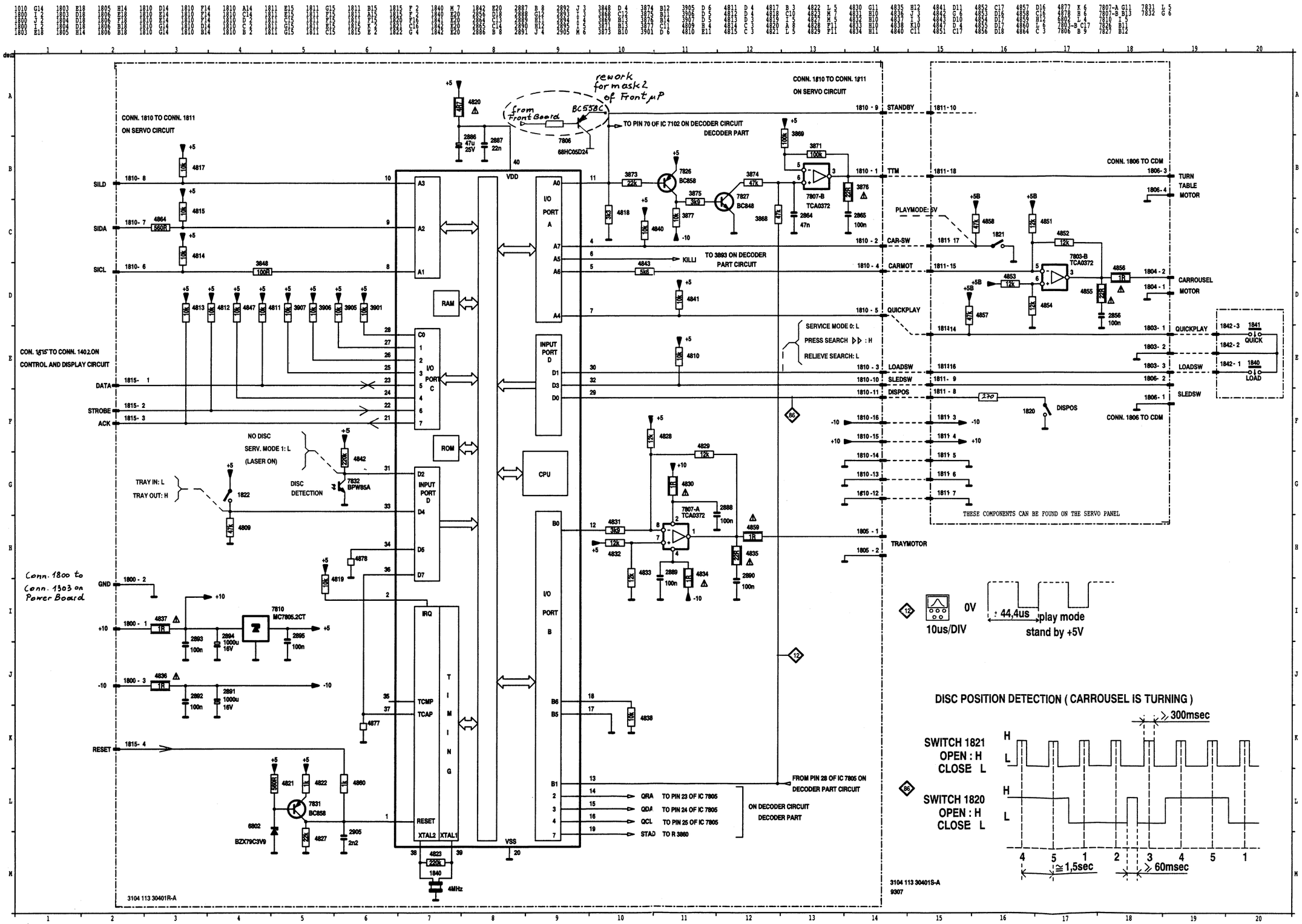


DECODER - MICROPROCESSOR PANEL

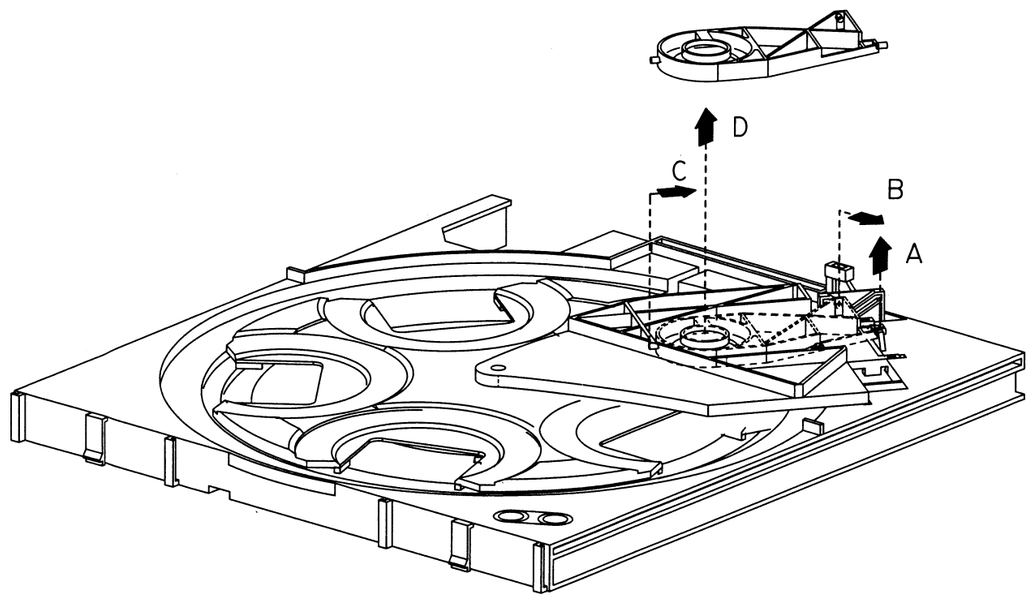
COPPER SIDE

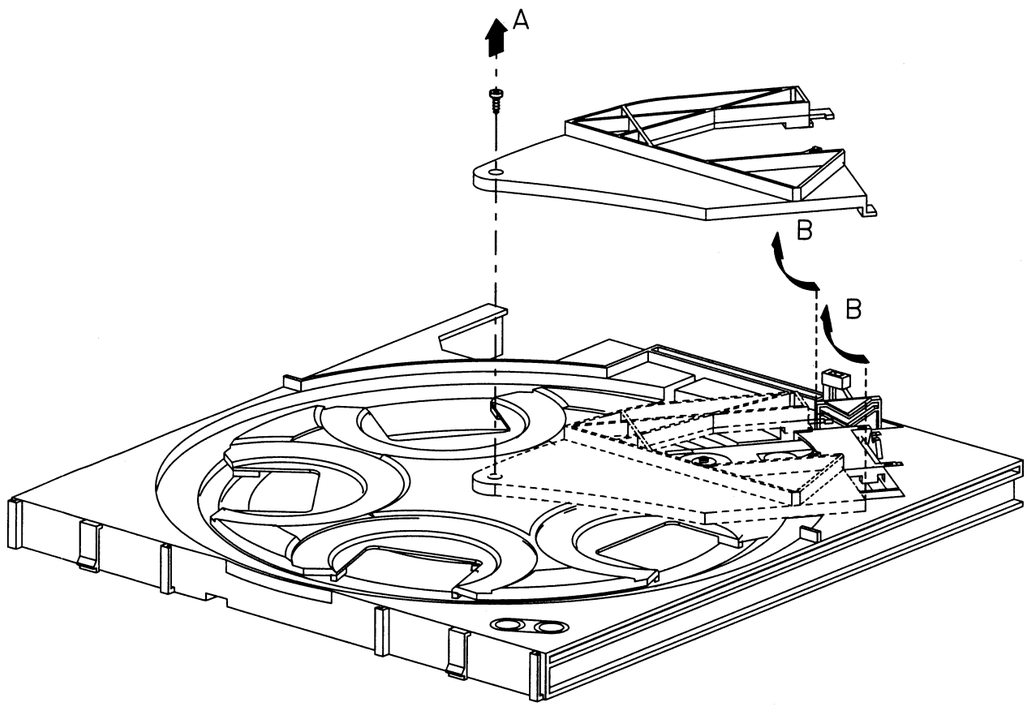


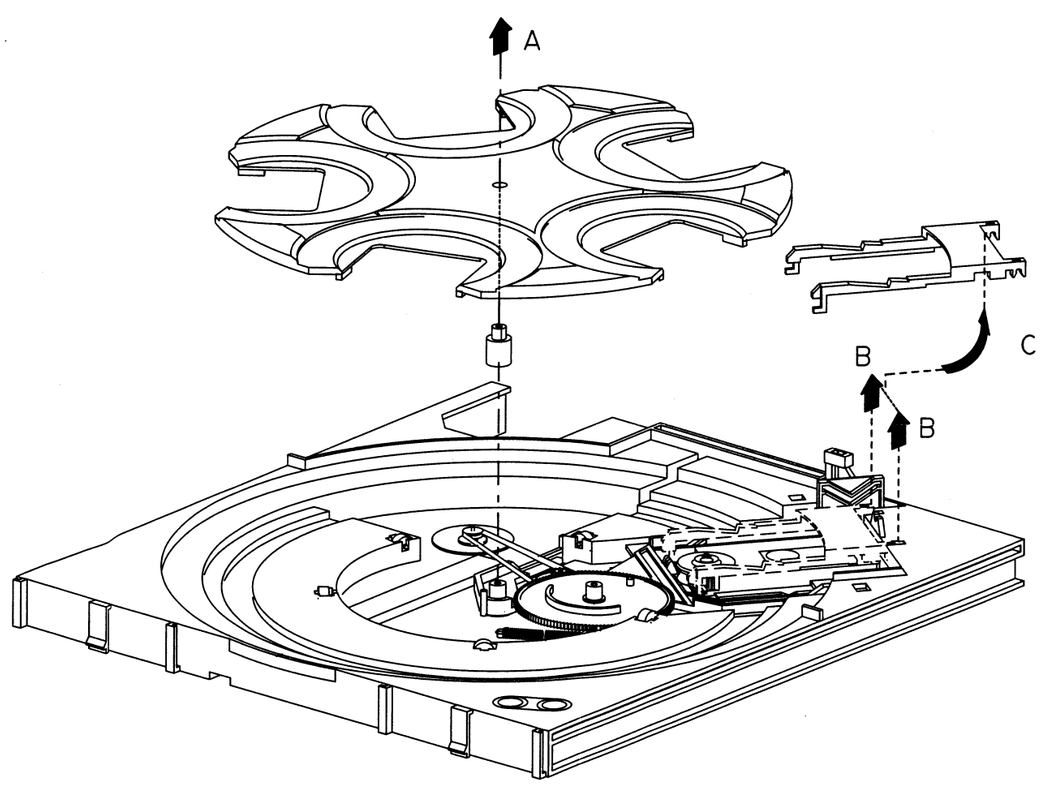
MICROPROCESSOR CIRCUIT

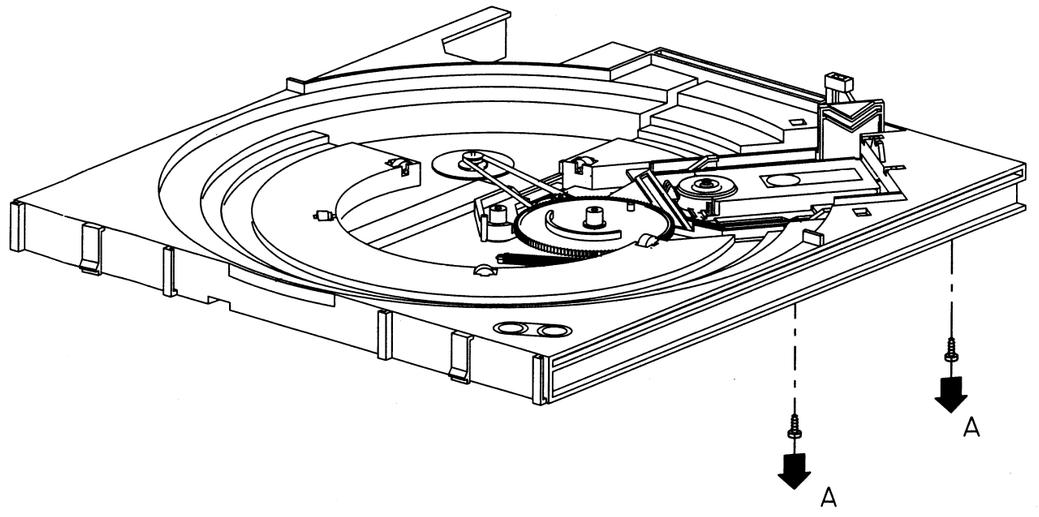


DEMOUNTING OF CARROUSEL
DEMOUNTING OF CDM

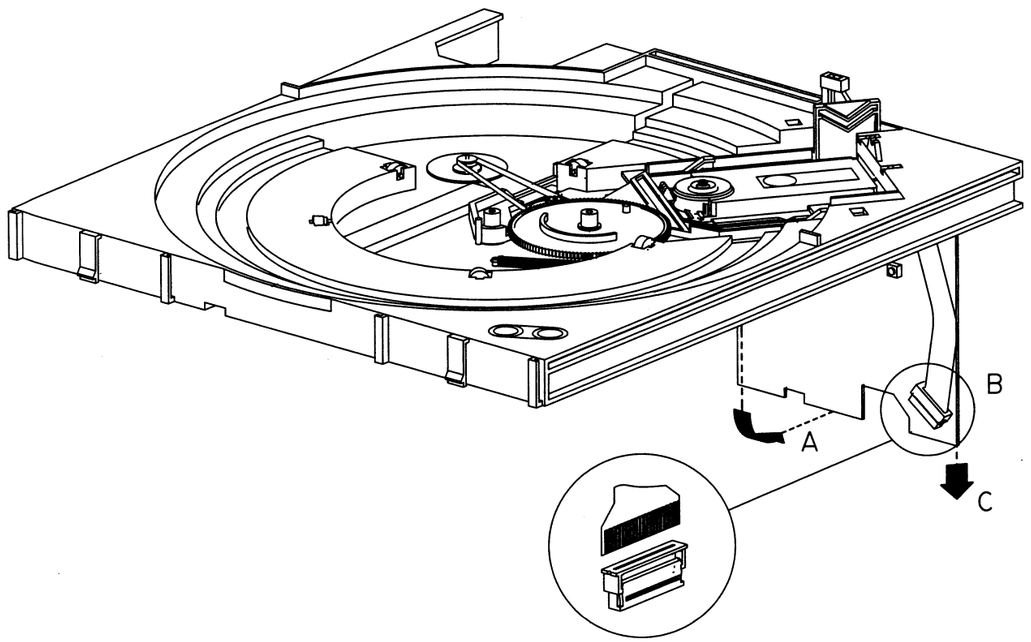


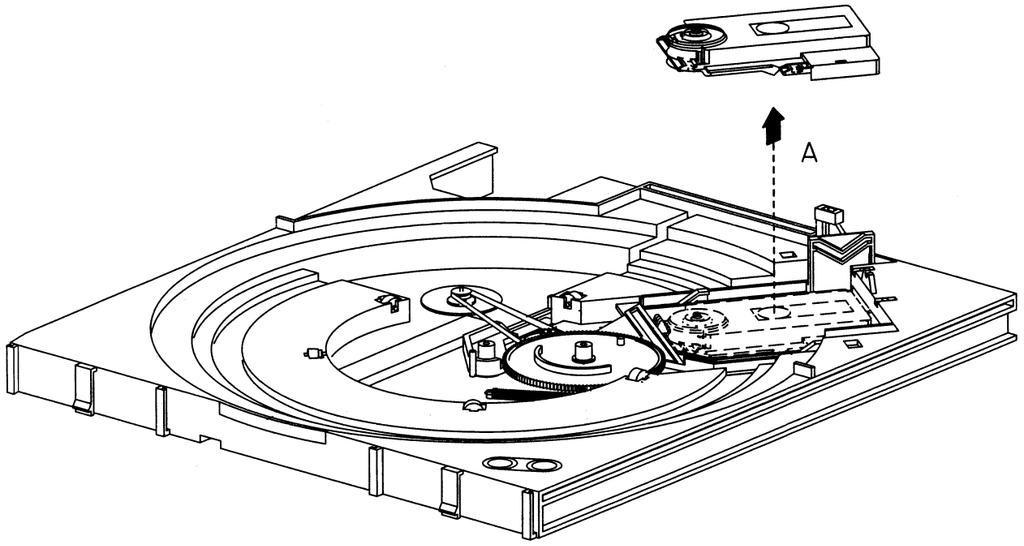


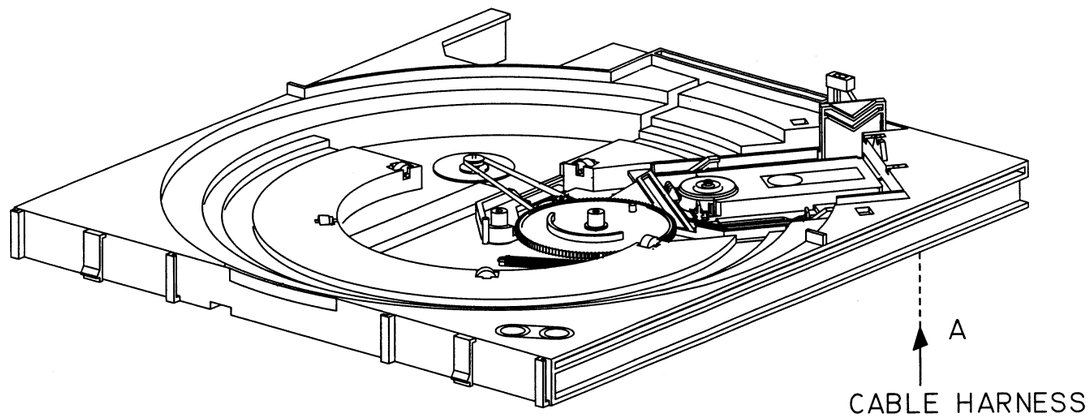




DEMOUNTING OF CDM







Partslist Loading

89	4822 466 93131	PRESSURE PLATE
90	4822 256 91912	PRESSURE RING HOLDER
91 + 92:	4822 532 52386	PRESSURE RING
94 + 128 + 129 + 130 + 141 + 142 + 144:	4822 426 90109	FRAME ASSY
95	4822 522 33255	GEARWHEEL
96	4822 535 40105	CRANK
98	4822 691 30278	CDM12.1
99	4822 403 70598	CDM LOCKING
100	4822 466 93129	ROTARY DISC
101	4822 520 20758	BEARING
103	4822 401 11447	TRAY TUMBLER
104 - 107	4822 466 93065	BLOCK
108 + 110 + 121 + 123 + 131 + 136 + 137 + 138 + 139 + 140:	4822 444 50685	TRAY ASSY
109	4822 532 51756	GROMMET
110	4822 401 11444	BRACKET
113	4822 492 52313	TENSION SPRING
114	4822 256 91915	SUPPORT
115 + 124 + 125	4822 466 93134	SLIDE STRIP
116	4822 522 33256	CAM WHEEL
119	4822 528 50335	MOTOR
120	4822 528 50335	MOTOR
121	4822 528 50334	PULLEY
122	4822 358 10115	DRIVING BELT
127 - 128 - 129 - 131 - 141 - 142	4822 466 93132	GUIDE
132	4822 403 70599	KEY UNIT
133	4822 466 93171	COVER
136 - 140	4822 528 70646	ROLLER
144	4822 528 50334	PULLEY
145	4822 358 10115	DRIVING BELT
146 - 147	4822 402 50291	LIFT TUMBLER
148 - 150	4822 492 52123	COMPRESSION SPRING

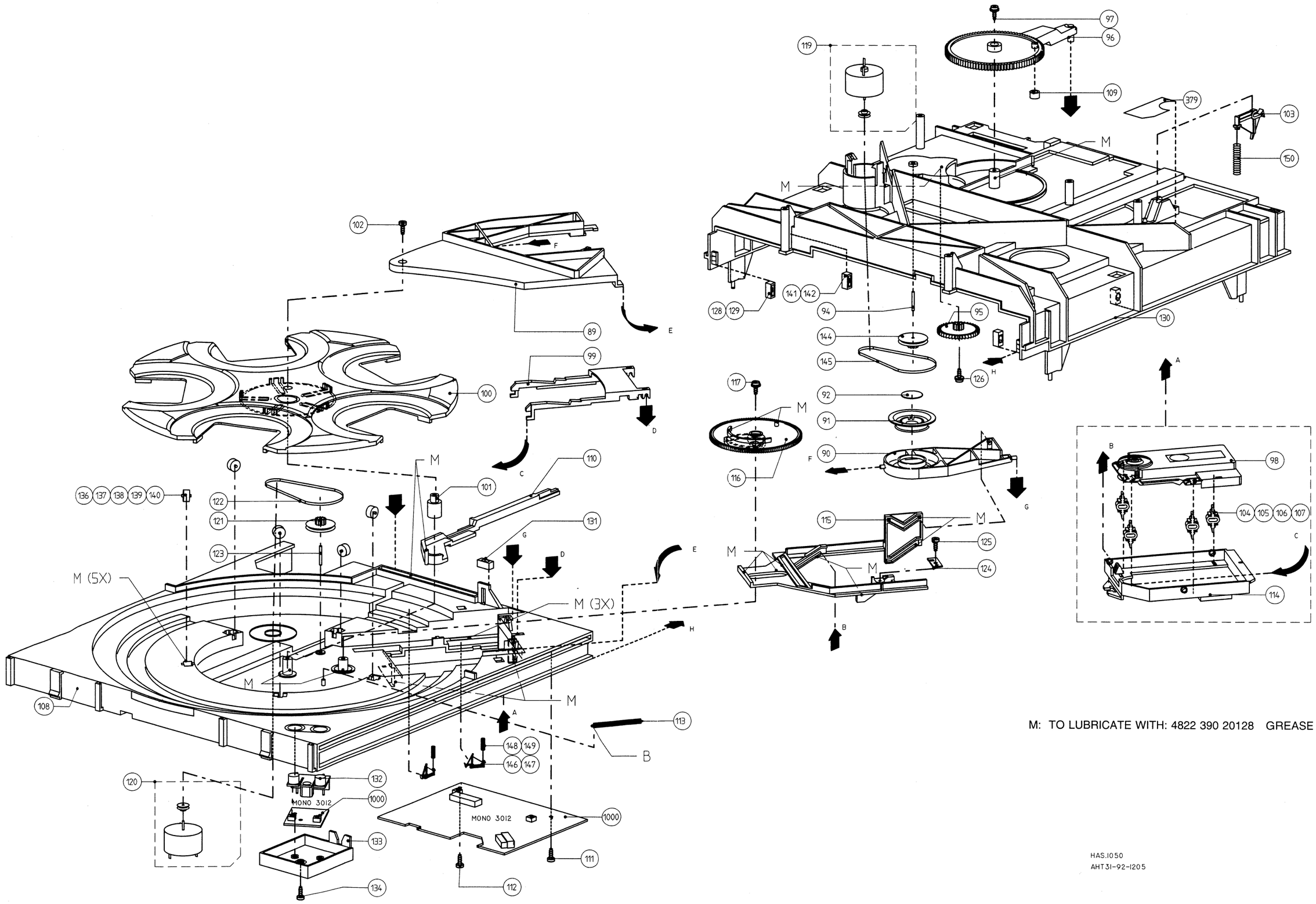
Plastite M3x10:
78, 79, 111, 112, 202, 203, 204, 259, 260
261, 262, 269, 270, 271

Plastite M3x12:
30, 31, 32, 33, 34, 37, 40, 41, 42, 43

M3x10 + washer:
97, 117, 126, 171, 172, 173, 174, 175, 176,
177, 178, 267, 268

M3x16:
102, 134

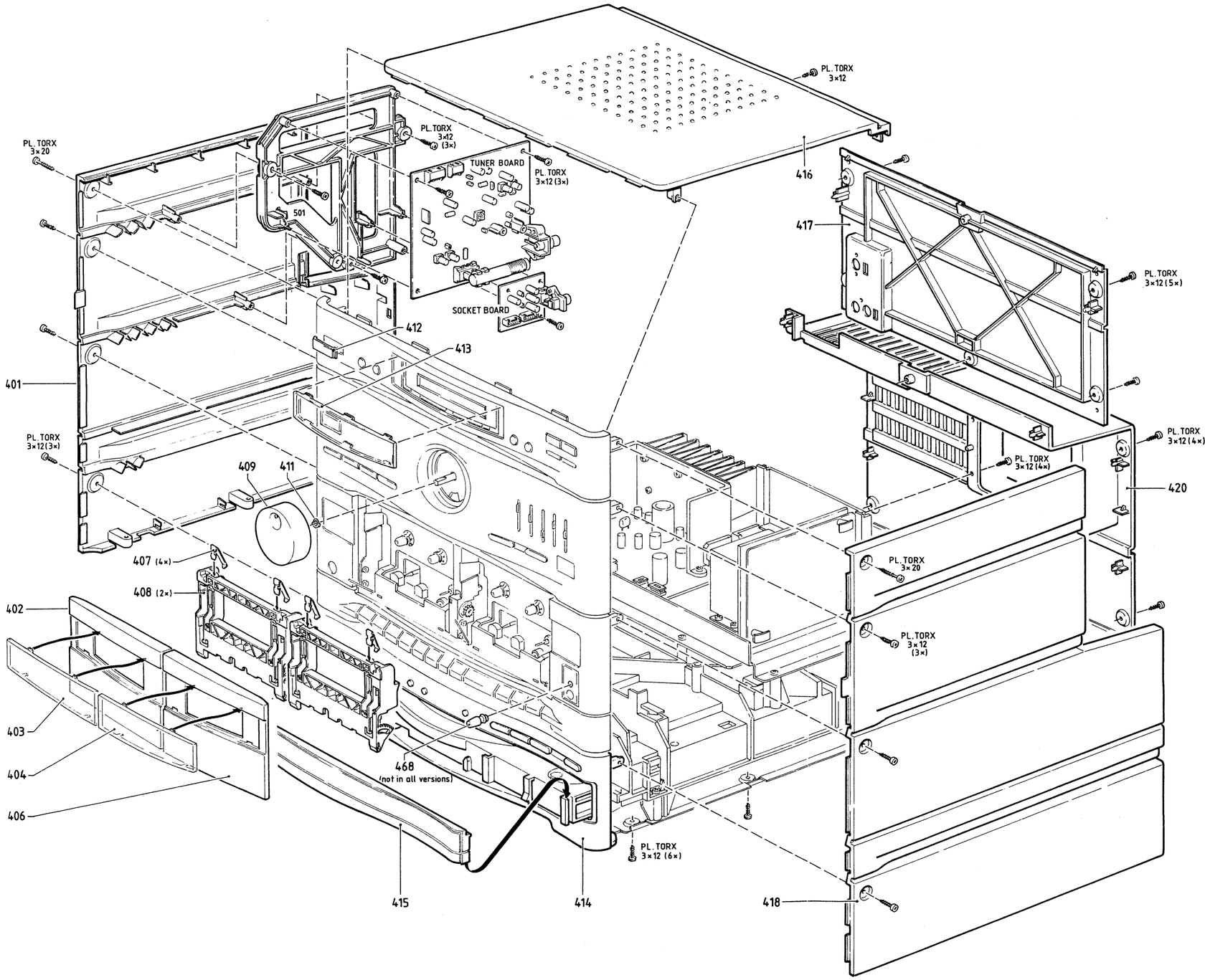
EXPLODED VIEW
LOADING



M: TO LUBRICATE WITH: 4822 390 20128 GREASE

HAS.1050
AHT31-92-1205

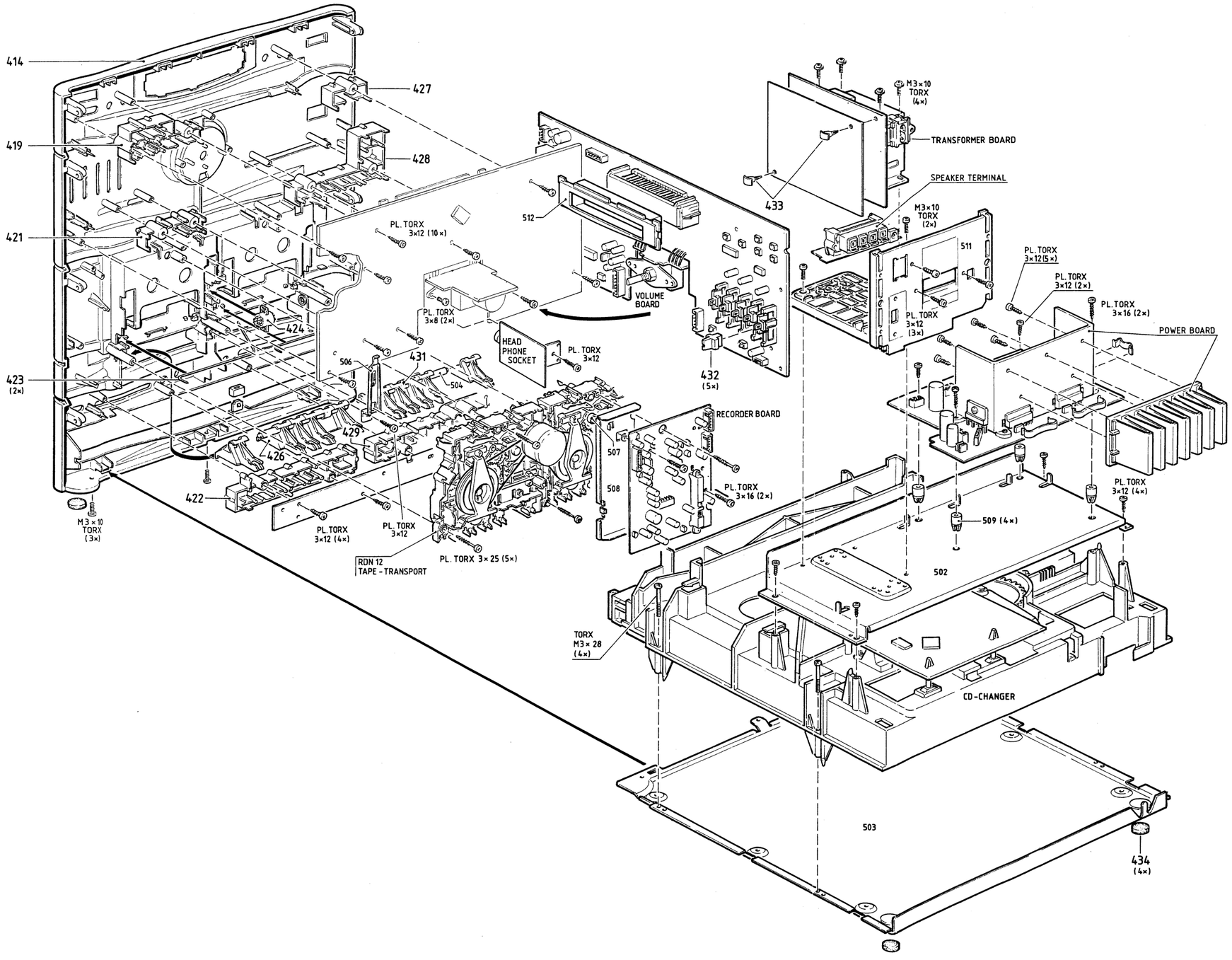
EXPLODED VIEW OF SET I



MECHANICAL PARTS

401	4822 426 30155	SIDE LEFT
402	4822 443 63936	CASS. DOOR A-DECK
403	4822 450 62087	WINDOW A-DECK
404	4822 450 62088	WINDOW B-DECK
406	4822 443 63935	CASS. DOOR B-DECK
407	4822 492 63927	SPRING,CASS.PRESS
408	4822 443 63037	DOOR,CASSETTE
409	4822 413 41792	KNOB VOLUME
411	4822 492 51374	SPRING KNOB CLAMP
412	4822 381 11418	IR WINDOW
413	4822 450 62074	WINDOW PRINTED
414	4822 426 51657	FRONT AS640/37
414	4822 426 51667	FRONT AS642/37
414	4822 426 51668	FRONT AS641/37
414	4822 426 51656	FRONT AS640/20,/20B,/21,/22,/25
414	4822 426 51658	FRONT AS645/21
415	4822 444 40666	FRONT CD TRAY
416	4822 426 60639	COVER
417	4822 426 60641	BACKPLATE TOP
418	4822 426 30154	SIDE RIGHT
419	4822 410 62618	KNOB PRSET UP/DOWN
420	4822 426 60642	BACKPLATE BOTTOM
421	4822 410 62683	KNOB HSD, FE/CHROME
422	4822 410 62685	KNOB CD RIGHT
423	4822 492 42595	SPRING CASS. COMPART
424	4822 529 10278	DAMPER
426	4822 410 62619	BUTTON SET
427	4822 410 62623	KNOB AUTOPROGRAM
428	4822 410 62617	KNOB SELECTOR+POWER
429	4822 410 62684	KNOB CD LEFT
431	4822 410 62621	BUTTON SET
432	4822 411 61929	KNOB EQUALIZER
433	4822 466 93148	SPACER
434	4822 462 40683	FOOT RUBBER
468	4822 410 62622	KNOB MICRO-MIX

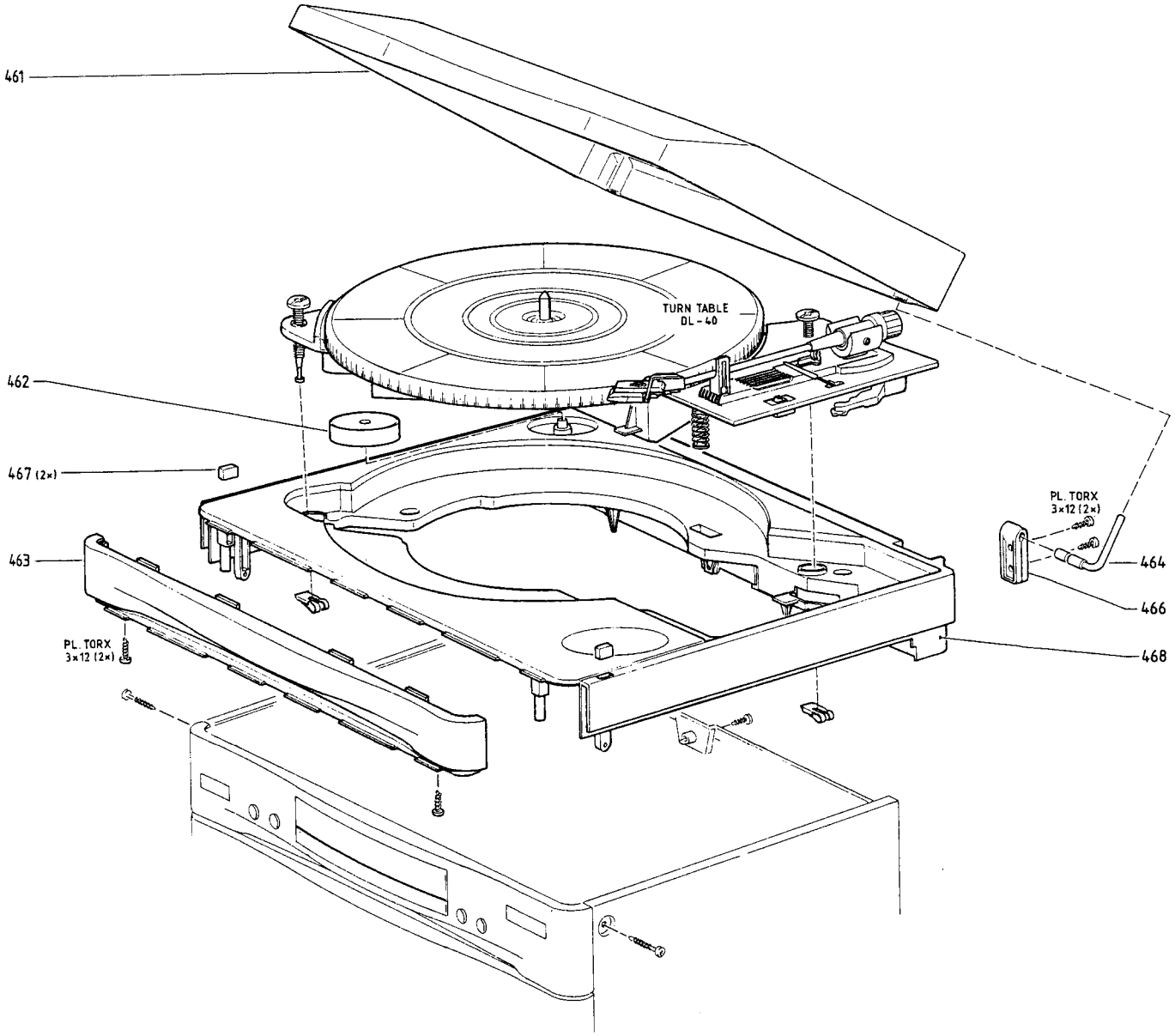
EXPLODED VIEW OF SET II



MECHANICAL PARTS

401	4822 426 30155	SIDE LEFT
402	4822 443 63936	CASS. DOOR A-DECK
403	4822 450 62087	WINDOW A-DECK
404	4822 450 62088	WINDOW B-DECK
406	4822 443 63935	CASS. DOOR B-DECK
407	4822 492 63927	SPRING,CASS.PRESS
408	4822 443 63037	DOOR,CASSETTE
409	4822 413 41792	KNOB VOLUME
411	4822 492 51374	SPRING KNOB CLAMP
412	4822 381 11418	IR WINDOW
413	4822 450 62074	WINDOW PRINTED
414	4822 426 51657	FRONT AS640/37
414	4822 426 51667	FRONT AS642/37
414	4822 426 51668	FRONT AS641/37
414	4822 426 51656	FRONT AS640/20, /20B, /21, /22, /25
414	4822 426 51658	FRONT AS645/21
415	4822 444 40666	FRONT CD TRAY
416	4822 426 60639	COVER
417	4822 426 60641	BACKPLATE TOP
418	4822 426 30154	SIDE RIGHT
419	4822 410 62618	KNOB PRSET UP/DOWN
420	4822 426 60642	BACKPLATE BOTTOM
421	4822 410 62683	KNOB HSD, FE/CHROME
422	4822 410 62685	KNOB CD RIGHT
423	4822 492 42595	SPRING CASS. COMPART
424	4822 529 10278	DAMPER
426	4822 410 62619	BUTTON SET
427	4822 410 62623	KNOB AUTOPROGRAM
428	4822 410 62617	KNOB SELECTOR+POWER
429	4822 410 62684	KNOB CD LEFT
431	4822 410 62621	BUTTON SET
432	4822 411 61929	KNOB EQUALIZER
433	4822 466 93148	SPACER
434	4822 462 40683	FOOT RUBBER
468	4822 410 62622	KNOB MICRO-MIX

ONLY FOR SETS WITH RECORD PLAYER



MECHANICAL PARTS TURNTABLE

461 4822 462 71935 DUST COVER
462 4822 466 92642 ADAPTOR
463 4822 444 40662 FRONT TURNTABLE
464 4822 417 10631 CLAMPING BLOCK
466 4822 417 10631 CLAMPING BLOCK

467 4822 462 41656 RUBBER PAD
468 not a sparepart

DIODES

6428	4822 130 34197	BZX79-C12 (UAW)
6431	4822 130 34174	BZX79-C4V7
6432	4822 130 30861	BZX79-C7V5
6442	4822 130 82021	LTL307G
6450	4822 130 30861	BZX79-C7V5
6453	4822 130 30621	1N4148

TRANSISTORS

7406	4822 130 40941	BC558
7408	4822 130 40938	BC548
7409	4822 130 41344	BC337-40
7410	4822 130 41344	BC337-40
7411	4822 130 41344	BC337-40
7412	4822 130 41344	BC337-40
7413	4822 130 40938	BC548
7421	4822 130 44196	BC548C
7423	4822 130 40941	BC558
7424	4822 130 41327	BC327-40
7426	4822 130 40941	BC558
7427	4822 130 40938	BC548
7432	4822 130 40938	BC548
7433	4822 130 40938	BC548
7440	4822 130 40941	BC558
7441	4822 130 40941	BC558
7445	5322 130 44779	BC338-40
7446	5322 130 44779	BC338-40
7447	4822 130 44246	BC549C
7448	4822 130 44246	BC549C

INTEGRATED CIRCUITS

7403	4822 209 83274	NJM4560D
7407	4822 209 83274	NJM4560D
7415	4822 209 32448	TMP87PH20F
7418	4822 209 31508	ST24C01
7419	5322 209 10421	HEF4094BP
7420	5322 209 10421	HEF4094BP
7422	4822 214 52009	GP1U58XP
7425	5322 209 86518	MC7805CT

COILS

5401	5322 242 73697	CERAM.RES. 8MHz
5402	4822 157 50961	22µH
5405	4822 157 62552	COIL 2,2µH

RESISTORS

3401	4822 116 52297	68k	5%	0,5W
3402	4822 116 52297	68k	5%	0,5W
3403	4822 116 52264	27k	5%	0,5W
3404	4822 116 52264	27k	5%	0,5W
3405	4822 116 52284	47k	5%	0,5W
3406	4822 116 52284	47k	5%	0,5W
3407	4822 116 52269	3k3	5%	0,5W
3408	4822 116 52269	3k3	5%	0,5W
3409	4822 116 52263	2k7	5%	0,5W
3410	4822 116 52263	2k7	5%	0,5W
3413	4822 116 52234	100k	5%	0,5W
3414	4822 116 52234	100k	5%	0,5W
3415	4822 116 52233	10k	5%	0,5W
3416	4822 116 52233	10k	5%	0,5W
3417	4822 116 52284	47k	5%	0,5W
3418	4822 116 52284	47k	5%	0,5W
3419	4822 116 52284	47k	5%	0,5W
3420	4822 116 52284	47k	5%	0,5W
3421	4822 116 52284	47k	5%	0,5W

RESISTORS

3422	4822 116 52284	47k	5%	0,5W
3423	4822 116 52284	47k	5%	0,5W
3424	4822 116 52284	47k	5%	0,5W
3425	4822 116 52224	470R	5%	0,5W
3426	4822 116 52224	470R	5%	0,5W
3427	4822 116 52257	22k	5%	0,5W
3428	4822 116 52257	22k	5%	0,5W
3431	4822 116 52263	2k7	5%	0,5W
3432	4822 116 52263	2k7	5%	0,5W
3433	4822 116 52219	330R	5%	0,5W
3434	4822 116 52219	330R	5%	0,5W
3435	4822 050 11002	1k	5%	0,2W
3436	4822 050 11002	1k	5%	0,2W
3437	4822 116 52264	27k	5%	0,5W
3438	4822 116 52264	27k	5%	0,5W
3439	4822 116 52224	470R	5%	0,5W
3440	4822 116 52224	470R	5%	0,5W
3441	4822 116 52224	470R	5%	0,5W
3442	4822 116 52224	470R	5%	0,5W
3443	4822 116 52291	56k	5%	0,5W
3444	4822 116 52291	56k	5%	0,5W
3445	4822 051 10333	33k	2%	0,25W
3446	4822 051 10333	33k	2%	0,25W
3447	4822 051 10333	33k	2%	0,25W
3448	4822 051 10333	33k	2%	0,25W
3449	4822 116 52264	27k	5%	0,5W
3450	4822 116 52264	27k	5%	0,5W
3451	4822 051 10333	33k	2%	0,25W
3452	4822 051 10333	33k	2%	0,25W
3455	4822 051 10333	33k	2%	0,25W
3456	4822 051 10333	33k	2%	0,25W
3457	4822 116 52264	27k	5%	0,5W
3458	4822 116 52264	27k	5%	0,5W
3459	4822 051 10333	33k	2%	0,25W
3460	4822 051 10333	33k	2%	0,25W
3461	4822 051 10333	33k	2%	0,25W
3462	4822 051 10333	33k	2%	0,25W
3463	4822 116 52285	470k	5%	0,5W
3464	4822 116 52285	470k	5%	0,5W
3465	4822 116 52296	6k8	5%	0,5W
3466	4822 116 52296	6k8	5%	0,5W
3469	4822 116 52283	4k7	5%	0,5W
3470	4822 116 52283	4k7	5%	0,5W
3471	4822 116 52256	2k2	5%	0,16W
3472	4822 116 52256	2k2	5%	0,16W
3473	4822 116 52257	22k	5%	0,5W
3474	4822 116 52257	22k	5%	0,5W
3475	4822 116 52224	470R	5%	0,5W
3476	4822 116 52224	470R	5%	0,5W
3477	4822 116 52256	2k2	5%	0,16W
3478	4822 116 52283	4k7	5%	0,5W
3480	4822 102 10414	POTM. 2x20kB		
3481	4822 101 21102	Pot 2x 50k		
3482	4822 101 21102	Pot 2x 50k		
3483	4822 101 21102	Pot 2x 50k		
3484	4822 101 21102	Pot 2x 50k		
3485	4822 101 21102	Pot 2x 50k		
3486	4822 050 11002	1k	5%	0,2W
3487	4822 050 11002	1k	5%	0,2W
3488	4822 050 11002	1k	5%	0,2W
3489	4822 050 11002	1k	5%	0,2W
3490	4822 116 52215	220R	5%	0,16W
3491	4822 116 52233	10k	5%	0,5W
3492	4822 116 52228	680R	5%	0,5W

CAPACITORS

2420	4822 122 33195	100pF	10%	50V
2421	4822 122 33848	47pF	5%	50V
2422	4822 122 33848	47pF	5%	50V
2423	4822 122 33848	47pF	5%	50V
2424	4822 122 33848	47pF	5%	50V
2425	4822 122 33195	100pF	10%	50V
2426	4822 122 33195	100pF	10%	50V
2427	4822 124 40242	1µF	20%	63V
2428	4822 124 40242	1µF	20%	63V
2429	4822 126 12702	270pF	10%	50V
2430	4822 126 12702	270pF	10%	50V
2431	4822 122 33197	1nF	10%	50V
2432	4822 122 33197	1nF	10%	50V
2433	4822 122 33197	1nF	10%	50V
2434	4822 122 33197	1nF	10%	50V
2435	4822 126 11714	4,7nF	20%	
2436	4822 126 11714	4,7nF	20%	
2437	4822 126 11714	4,7nF	20%	
2438	4822 126 11714	4,7nF	20%	
2439	4822 126 11585	22nF		50V
2440	4822 126 11585	22nF		50V
2441	4822 126 11585	22nF		50V
2442	4822 126 11585	22nF		50V
2443	4822 121 43526	47nF	5%	100V
2444	4822 121 43526	47nF	5%	100V
2445	4822 121 42408	220nF	5%	63V
2446	4822 121 42408	220nF	5%	63V
2447	4822 122 33848	47pF	5%	50V
2448	4822 122 33848	47pF	5%	50V
2449	4822 122 33195	100pF	10%	50V
2450	4822 122 33195	100pF	10%	50V
2451	4822 124 40246	4,7uF	20%	63V
2452	4822 124 40246	4,7uF	20%	63V
2453	4822 121 51387	10nF	20%	16V
2454	4822 121 51387	10nF	20%	16V
2455	4822 122 33192	27pF	5%	50V
2456	4822 122 33192	27pF	5%	50V
2460	4822 124 40239	0,47µF	20%	63V
2461	4822 126 11585	22nF		50V
2462	4822 126 11585	22nF		50V
2463	4822 126 11585	22nF		50V
2464	4822 124 41525	100µF	20%	25V
2465	4822 124 22263	220µF	20%	25V
2466	4822 124 40248	10µF	20%	63V
2467	4822 124 22263	220µF	20%	25V
2468	4822 124 40248	10µF	20%	63V
2469	4822 124 40242	1µF	20%	63V
2470	4822 124 40242	1µF	20%	63V
2471	4822 122 33519	470pF	10%	50V
2472	4822 122 33519	470pF	10%	50V
2473	4822 124 40433	47µF	20%	25V
2475	4822 124 22263	220µF	20%	25V
2476	4822 124 41525	100µF	20%	25V
2477	4822 124 40433	47µF	20%	25V
2483	4822 122 33197	1nF	10%	50V
2484	4822 122 33197	1nF	10%	50V
2485	4822 122 33197	1nF	10%	50V
2502	4822 124 41525	100µF	20%	25V
2503	4822 124 41525	100µF	20%	25V
2504	5322 124 21643	22µF	20%	40V
2505	4822 126 11585	22nF		50V
2507	4822 126 12702	270pF	10%	50V
2508	4822 122 33848	47pF	5%	50V
2509	4822 122 33848	47pF	5%	50V

CAPACITORS

2510	4822 122 33848	47pF	5%	50V
2512	4822 124 40242	1µF	20%	63V
2513	4822 124 40248	10µF	20%	63V
2514	4822 126 12702	270pF	10%	50V
2552	4822 122 10466	220pF	10%	
2553	4822 122 10466	220pF	10%	
2554	4822 122 33197	1nF	10%	50V
2555	4822 122 33197	1nF	10%	50V
2556	4822 122 33195	100pF	10%	50V
2557	4822 122 33195	100pF	10%	50V
2558	5322 121 42386	100nF	5%	63V

CHIP CAPACITORS

2481	4822 122 33575	220pF	5%	50V
2482	4822 122 33575	220pF	5%	50V

CAPACITORS

2713	4822 124 40433	47µF	20%	25V
2720	4822 122 10174	1,5nF	10%	50V
2721	4822 122 33534	1,2nF	10%	50V
2722	4822 124 22466	1µF	20%	50V
2723	4822 124 22633	22µF	20%	35V
2724	4822 126 11595	470pF	10%	50V
2725	4822 124 40433	47µF	20%	25V
2726	4822 124 40433	47µF	20%	25V
2728	4822 124 40435	10µF	20%	50V
2730	4822 126 11325	4,7nF	10%	50V
2731	4822 121 41857	10nF	5%	250V
2732	4822 122 10158	1nF	10%	50V
2751	4822 122 10173	820pF	10%	50V
2753	4822 124 41643	100µF	20%	16V
2754	4822 126 11595	470pF	10%	50V
2758	4822 124 40435	10µF	20%	50V
2759	4822 121 41857	10nF	5%	250V
2762	4822 126 11311	4,7nF		50V
2770	4822 122 10174	1,5nF	10%	50V
2771	4822 122 33534	1,2nF	10%	50V
2772	4822 124 22466	1µF	20%	50V
2773	4822 124 22633	22µF	20%	35V
2774	4822 126 11595	470pF	10%	50V
2775	4822 124 40184	1000µF	20%	10V
2778	4822 124 40435	10µF	20%	50V
2781	4822 121 41857	10nF	5%	250V
2782	4822 122 10158	1nF	10%	50V
2783	4822 121 41935	12nF	5%	250V
2784	4822 124 40242	1µF	20%	63V
2785	4822 121 51305	15nF	10%	50V
2786	4822 122 10183	100pF	5%	50V
2788	4822 124 40433	47µF	20%	25V
2789	4822 124 40433	47µF	20%	25V
2790	4822 124 40433	47µF	20%	25V
2791	4822 124 22263	220µF	20%	25V

POWER BOARD

MECHANICAL PARTS

	4822 255 40128	CLIP TO126
	5322 255 40397	CLIP IC

MISCELLANEOUS

1304	4822 267 31176	SPEAKER TERMINAL
1305	4822 264 30175	SOCKET EXT. SUPPLY

DIODES

6250	4822 130 82079	D3SBA20
6251	4822 130 30621	1N4148
6252	4822 130 30621	1N4148
6253	4822 130 34174	BZX79-C4V7
6254	4822 130 30621	1N4148
6255	5322 130 30684	1N4002
6256	5322 130 30684	1N4002
6257	5322 130 30684	1N4002
6258	5322 130 30684	1N4002
6259	4822 130 30621	1N4148
6261	5322 130 30684	1N4002
6350	4822 130 30621	1N4148
6351	4822 130 30621	1N4148
6352	4822 130 34278	BZX79-C6V8
6354	4822 130 30621	1N4148

TRANSISTORS

7250	4822 130 40937	BC548B
7252	4822 130 61236	BD234
7253	4822 130 40937	BC548B
7254	4822 130 40937	BC548B
7255	4822 130 44197	BC558B
7309	4822 130 41344	BC337-40
7310	4822 130 41344	BC337-40
7311	4822 130 41344	BC337-40
7312	4822 130 41344	BC337-40
7350	4822 130 41344	BC337-40
7351	4822 130 40937	BC548B
7352	4822 130 40937	BC548B

INTEGRATED CIRCUITS

7313	4822 209 73356	AN7161N(FP)
7314	4822 209 73356	AN7161N(FP)

COILS

5309	4822 157 62552	COIL 2,2µH
5310	4822 157 62552	COIL 2,2µH
5311	4822 157 62552	COIL 2,2µH
5312	4822 157 62552	COIL 2,2µH
5315	4822 157 62552	COIL 2,2µH
5316	4822 157 62552	COIL 2,2µH

RESISTORS

3250	4822 050 11002	1k	5%	0,2W
3251	4822 116 52233	10k	5%	0,5W
3252	4822 116 52233	10k	5%	0,5W
3254	4822 051 10333	33k	2%	0,25W
3255	4822 050 11002	1k	5%	0,2W
3256	4822 050 11002	1k	5%	0,2W
3257	4822 116 52233	10k	5%	0,5W
3258	4822 116 52283	4k7	5%	0,5W
3259	4822 051 10333	33k	2%	0,25W
3260	4822 116 52233	10k	5%	0,5W

ECO4 Tuner

MISCELLANEOUS

1101	4822 267 10283	SOCKET COAX IEC 75R
1101	4822 265 20598	F-CONNECT. COAX 75R

DIODES

6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6122	4822 130 30621	1N4148
6121	4822 130 30621	1N4148
6123	4822 130 30621	1N4148
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148
6154	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

TRANSISTORS

7102	5322 130 42136	BC848C(CHIP)
7104	5322 130 42136	BC848C(CHIP)
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121	5322 130 42136	BC848C(CHIP)
7123	5322 130 42136	BC848C(CHIP)
7128	5322 130 42136	BC848C(CHIP)
7152	5322 130 41983	BC858B(CHIP)
7156	4822 130 41344	BC337-40
7157	4822 130 41344	BC337-40
7169	5322 130 41983	BC858B(CHIP)
7170	5322 130 42136	BC848C(CHIP)
7171	5322 130 42136	BC848C(CHIP)
7174	5322 130 41983	BC858B(CHIP)
7178	5322 130 41983	BC858B(CHIP)
7179	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

7140	4822 209 32011	TEA5712T/N1 (Radio-IC)
7150	5322 209 14482	HEF4069UBT (6xINVERTER)
7172	4822 209 30606	MM74HCU04M (6xINVERTER)
7173	4822 209 31998	LC7218M SYNTHESIZER

COILS

5105	4822 158 60641	Ferrite ant.,MW/LW
5106	4822 158 60642	Ferrite ant.,MW
5109	4822 156 30947	RF COIL var. 1,5 TURNS
5120	4822 156 30947	RF COIL var. 1,5 TURNS
5122	4822 157 60517	COIL var. 110µH 8%
5123	4822 157 60517	COIL var. 110µH 8%
5140	4822 158 60511	AM-IF FILTER 450kHz
5142	4822 157 70302	AM-IF FILTER 450kHz
5143	4822 242 70665	CER. FILTER 10,7MHZ
5144	4822 242 70665	CER. FILTER 10,7MHZ
5145	4822 242 81362	CER. DISCRIMINATOR
5150	4822 157 50975	1mH 10%
5170	4822 242 72976	CER.RESONATOR 7,2MHz
5171	4822 157 50963	2,2µH

RESISTORS

3119	4822 116 52224	470R	5%	0,5W
3120	4822 116 52289	5k6	5%	0,16W
3124	4822 116 52256	2k2	5%	0,16W
3132	4822 116 52283	4k7	5%	0,5W
3141	4822 116 52215	220R	5%	0,1 6W
3148	4822 100 11682	POTMETER 47k LIN.		
3151	4822 116 52243	1k5	5%	0,16W
3156	4822 116 52233	10k	5%	0,5W
3162	4822 050 11002	1k	5%	0,2W
3163	4822 050 11002	1k	5%	0,2W
3164	4822 116 52283	4k7	5%	0,5W
3165	4822 116 52283	4k7	5%	0,5W
3170	4822 116 52283	4k7	5%	0,5W
3173	4822 116 52244	15k	5%	0,5W
3174	4822 116 52233	10k	5%	0,5W
3177	4822 116 52233	10k	5%	0,5W
3181	4822 116 52234	100k	5%	0,5W
3189	4822 116 52249	1k8	5%	0,16W
3190	4822 116 52249	1k8	5%	0,16W
3191	4822 116 52249	1k8	5%	0,16W
3192	4822 116 52249	1k8	5%	0,16W
3193	4822 116 52224	470R	5%	0,5W
3194	4822 050 24701	470R	5%	
3195	4822 050 24701	470R	5%	
3197	4822 050 24701	470R	5%	

CHIP RESISTORS

3106	4822 051 20104	100k	5%	0,1W
3107	4822 051 20222	2k2	5%	0,1W
3108	4822 051 20104	100k	5%	0,1W
3109	4822 051 20222	2k2	5%	0,1W
3110	4822 051 20473	47k	5%	0,1W
3111	4822 051 20153	15k	5%	0,1W
3112	4822 051 20223	22k	5%	0,1W
3116	4822 051 20335	3M3	5%	0,1W
3121	4822 051 20104	100k	5%	0,1W
3122	4822 051 20471	470R	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3125	4822 051 20472	4k7	5%	0,1W
3128	4822 051 20222	2k2	5%	0,1W
3129	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20222	2k2	5%	0,1W
3144	4822 051 20473	47k	5%	0,1W
3147	4822 051 20184	180k	5%	0,1W
3149	4822 051 20683	68k	5%	0,1W
3154	4822 051 20333	33k	5%	0,1W
3155	4822 051 20333	33k	5%	0,1W
3157	4822 051 20473	47k	5%	0,1W
3158	4822 051 20189	18R	5%	0,1W
3160	4822 051 20823	82k	5%	0,1W
3161	4822 051 20823	82k	5%	0,1W
3166	4822 051 20101	100R	5%	0,1W
3167	4822 051 20008	CHIP JUMPER 0805		
3171	4822 051 20101	100R	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3175	4822 051 20104	100k	5%	0,1W
3176	4822 051 20104	100k	5%	0,1W
3178	4822 051 20104	100k	5%	0,1W
3179	4822 051 20223	22k	5%	0,1W
3180	4822 051 20104	100k	5%	0,1W
3183	4822 051 20223	22k	5%	0,1W
3184	4822 051 20223	22k	5%	0,1W

TUNER 92

MISCELLANEOUS

1101	4822 210 10492	FRONTEND ASSY /02/08
1110	4822 267 10283	SOCKET COAX IEC 75R

DIODES

6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	HN1V02H
6109	4822 130 30621	1N4148

TRANSISTORS

7101	4822 130 60163	2SC1047
7104	5322 130 60068	BC558C
7106	5322 130 60068	BC558C
7107	5322 130 41982	BC848 (CHIP)
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7111	5322 130 41982	BC848 (CHIP)
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	4822 130 40937	BC548B
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7119	5322 130 41983	BC858B(CHIP)
7120	4822 130 44196	BC548C
7150	5322 130 44779	BC338-40
7151	4822 130 60163	2SC1047
7157	5322 130 44779	BC338-40

INTEGRATED CIRCUITS

7103	4822 209 31001	LA1851N
7105	4822 209 30178	LC7218

COILS

5101	4822 157 53192	0,22µH
5103	4822 242 81249	CER. FILTER 10,7MHz
5104	4822 157 63029	AM IF COIL
5105	4822 157 63904	Q-DETECION COIL
5106	4822 157 63802	BIRDY FILTER
5108	4822 157 63912	OSC.COIL AM 3-BAND
5110	4822 242 71878	CERAM.RES. 450kHz
5111	4822 242 81248	CER. FILTER 10,7MHz
5112	4822 242 72976	CER.RESONATOR 7,2MHz
5113	4822 242 81249	CER. FILTER 10,7MHz
5114	4822 152 20699	560µH
5127	4822 158 60643	FERROCEPTOR

RESISTORS

3101	4822 052 10478	4R7	5%	NFR
3108	4822 116 52224	470R	5%	0,5W
3113	4822 050 22201	220R	2%	0,25W
3118	4822 050 22201	220R	2%	0,25W
3120	4822 052 10229	22R	5%	0,33W
3125	4822 100 11213	22k	30%	POT.
3131	4822 100 11319	4k7 trimpot.		
3134	4822 050 15602	5k6	1%	0,4W
3138	4822 116 83922	150R	5%	1W
3147	4822 050 15602	5k6	1%	0,4W
3150	4822 050 25601	560R	1%	0,6W
3151	4822 050 24702	4k7	1%	0,6W
3155	4822 050 22201	220R	2%	0,25W
3158	4822 050 24702	4k7	1%	0,6W
3162	4822 050 22701	270R	1%	0,6W

RESISTORS

3165	4822 050 21002	1k	1%	0,6W
3166	4822 050 21002	1k	1%	0,6W
3167	4822 050 21002	1k	1%	0,6W
3183	4822 050 21003	10k	2%	0,25W
3186	4822 050 21003	10k	2%	0,25W
3225	4822 050 21002	1k	1%	0,6W
3244	5322 116 44005	250R	25%	

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3104	4822 051 20154	150k	5%	0,1W
3105	4822 051 20562	5k6	5%	0,1W
3106	4822 051 20829	82R	5%	0,1W
3107	4822 051 20104	100k	5%	0,1W
3114	4822 051 20332	3k3	5%	0,1W
3115	4822 051 20391	390R	5%	0,1W
3116	4822 051 20478	4R7	5%	0,1W
3117	4822 051 20331	330R	5%	0,1W
3121	4822 051 20272	2k7	5%	0,1W
3122	4822 051 20562	5k6	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3124	4822 051 20103	10k	5%	0,1W
3126	4822 051 20123	12k	2%	0,1W
3127	4822 051 20562	5k6	5%	0,1W
3129	4822 051 20103	10k	5%	0,1W
3132	4822 051 20183	18k	5%	0,1W
3133	4822 051 20008	CHIP JUMPER 0805		
3135	4822 051 10008	CHIP JUMPER 1206		
3141	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20472	4k7	5%	0,1W
3143	4822 051 20821	820R	5%	0,1W
3144	4822 051 20331	330R	5%	0,1W
3145	4822 051 20271	270R	5%	0,1W
3148	4822 051 20104	100k	5%	0,1W
3149	4822 051 20472	4k7	5%	0,1W
3152	4822 051 20103	10k	5%	0,1W
3153	4822 051 20274	270k	5%	0,1W
3156	4822 051 20153	15k	5%	0,1W
3157	4822 051 20472	4k7	5%	0,1W
3159	4822 051 20104	100k	5%	0,1W
3160	4822 051 20104	100k	5%	0,1W
3163	4822 051 20103	10k	5%	0,1W
3164	4822 051 20473	47k	5%	0,1W
3170	4822 051 20103	10k	5%	0,1W
3171	4822 051 20223	22k	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3173	4822 051 20223	22k	5%	0,1W
3184	4822 051 20332	3k3	5%	0,1W
3185	4822 051 20103	10k	5%	0,1W
3187	4822 051 20103	10k	5%	0,1W
3190	4822 051 20479	47R	5%	0,1W
3194	4822 051 20472	4k7	5%	0,1W
3196	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20008	CHIP JUMPER 0805		
3198	4822 051 20103	10k	5%	0,1W
3200	4822 051 20008	CHIP JUMPER 0805		
3201	4822 051 20103	10k	5%	0,1W
3202	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20474	470k	5%	0,1W

CD BOARDS

MISCELLANEOUS

	4822 361 21423	MOTOR
	4822 361 21423	MOTOR
	4822 255 40991	SOCKET LED
1822	4822 276 13106	SWITCH
1820	4822 276 13106	SWITCH
1821	4822 276 13106	SWITCH
1830	4822 071 51601	FUSE 160mA
1831	4822 071 51601	FUSE 160mA
1840	4822 276 13114	TACT SWITCH
1841	4822 276 13114	TACT SWITCH
	4822 323 50157	CONNECTION CABLE

DIODES

6800	4822 130 30621	1N4148
6801	4822 130 34173	BZX79-C5V6
6802	4822 130 31981	BZX79-C3V9

TRANSISTORS

7826	5322 130 42012	BC858 (CHIP)
7827	4822 130 61207	BC848 (CHIP)
7828	4822 130 42616	BC818-40 (UAW)
7829	5322 130 42012	BC858 (CHIP)
7830	4822 130 42616	BC818-40 (UAW)
7831	5322 130 42012	BC858 (CHIP)
7832	4822 130 83031	BPW85
7820	4822 130 60887	BF840
7821	5322 130 41982	BC848 (CHIP)
7822	5322 130 41983	BC858B(CHIP)
7823	5322 130 41982	BC848 (CHIP)
7824	5322 130 41982	BC848 (CHIP)
7825	4822 130 42675	BC818

INTEGRATED CIRCUITS

7804	4822 209 32036	UM6264BM-10L, RAM
7805	4822 209 30388	SAA7341GP
7806	4822 209 32419	MC68HC05D9-CDC MODUL
7807	4822 209 72587	TCA372DP2
7808	4822 209 83274	NJM4560D
7809	4822 209 83274	NJM4560D
7810	4822 209 71579	TY40408
7800	4822 209 31064	TDA1301T/N1
7801	4822 209 71579	TY40408
7802	4822 209 72587	TCA372DP2
7803	4822 209 72587	TCA372DP2

COILS

1801	4822 242 81151	X-TAL 16,934MHz
1840	4822 242 72527	CERAMIC RES. 4.0 MHz
1802	4822 242 73557	CERAMIC RES. 8,46MHz

RESISTORS

3856	4822 116 52256	2k2	5%	0,16W
3860	4822 050 11002	1k	5%	0,2W
3861	4822 050 22205	2M2	1%	0,6W
3862	4822 116 52256	2k2	5%	0,16W
3863	4822 052 10338	3R3		NFR25
3865	4822 116 52226	560R	5%	0,5W
3868	4822 116 52284	47k	5%	0,5W
3869	4822 116 52234	100k	5%	0,5W
3873	4822 116 52257	22k	5%	0,5W
3874	4822 116 52284	47k	5%	0,5W

RESISTORS

3876	4822 052 10229	22R	5%	0,33W
3878	4822 052 10229	22R	5%	0,33W
3879	4822 116 52269	3k3	5%	0,5W
3880	4822 050 21503	15k	1%	0,6W
3881	4822 050 21503	15k	1%	0,6W
3882	4822 116 52257	22k	5%	0,5W
3883	4822 050 11002	1k	5%	0,2W
3884	4822 116 52257	22k	5%	0,5W
3885	4822 116 52244	15k	5%	0,5W
3886	4822 116 52251	18k	5%	0,5W
3887	4822 116 52238	12k	5%	0,5W
3888	4822 050 21503	15k	1%	0,6W
3889	4822 050 21503	15k	1%	0,6W
3890	4822 050 11002	1k	5%	0,2W
3891	4822 052 10229	22R	5%	0,33W
3892	4822 052 10229	22R	5%	0,33W
3893	4822 116 52233	10k	5%	0,5W
3894	4822 116 52233	10k	5%	0,5W
3895	4822 116 52233	10k	5%	0,5W
3896	4822 116 52251	18k	5%	0,5W
3897	4822 116 52238	12k	5%	0,5W
3898	4822 050 21503	15k	1%	0,6W
3899	4822 116 52226	560R	5%	0,5W
3901	4822 116 52233	10k	5%	0,5W
3905	4822 116 52233	10k	5%	0,5W
3906	4822 116 52233	10k	5%	0,5W
3907	4822 116 52233	10k	5%	0,5W
4800	4822 050 11002	1k	5%	0,2W
4801	4822 050 21503	15k	1%	0,6W
4802	4822 116 52257	22k	5%	0,5W
4803	4822 116 52244	15k	5%	0,5W
4804	4822 050 21503	15k	1%	0,6W
4805	4822 050 21503	15k	1%	0,6W
4806	4822 050 11002	1k	5%	0,2W
4807	4822 116 52269	3k3	5%	0,5W
4808	4822 116 52257	22k	5%	0,5W
4813	4822 116 52233	10k	5%	0,5W
4814	4822 116 52233	10k	5%	0,5W
4817	4822 116 52233	10k	5%	0,5W
4819	4822 116 52233	10k	5%	0,5W
4820	4822 052 10478	4R7	5%	NFR
4824	4822 116 52233	10k	5%	0,5W
4825	4822 116 52233	10k	5%	0,5W
4826	4822 116 52233	10k	5%	0,5W
4828	4822 116 52238	12k	5%	0,5W
4829	4822 116 52238	12k	5%	0,5W
4830	4822 052 10108	1R	5%	0,33W
4831	4822 116 52276	3k9	5%	0,5W
4832	4822 116 52238	12k	5%	0,5W
4834	4822 052 10108	1R	5%	0,33W
4835	4822 052 10229	22R	5%	0,33W
4836	4822 052 10108	1R	5%	0,33W
4837	4822 052 10108	1R	5%	0,33W
4840	4822 116 52233	10k	5%	0,5W
4847	4822 116 52233	10k	5%	0,5W
4848	4822 116 52233	10k	5%	0,5W
4849	4822 116 52233	10k	5%	0,5W
4859	4822 052 10108	1R	5%	0,33W
3800	4822 116 52239	120k	5%	0,5W
3801	4822 116 52233	10k	5%	0,5W
3802	4822 116 52239	120k	5%	0,5W
3803	4822 116 52233	10k	5%	0,5W
3804	4822 116 52291	56k	5%	0,5W
3805	4822 116 52233	10k	5%	0,5W

CD BOARDS

MISCELLANEOUS

1820	4822 276 13106	SWITCH
1821	4822 276 13106	SWITCH
1822	4822 276 13106	SWITCH
1830	4822 071 51601	FUSE 160mA
1831	4822 071 51601	FUSE 160mA
1840	4822 276 13114	TACT SWITCH
1841	4822 276 13114	TACT SWITCH
	4822 323 50157	CONNECTION CABLE
	4822 255 40991	SOCKET LED

DIODES

6800	4822 130 30621	1N4148
6801	4822 130 34173	BZX79-C5V6
6802	4822 130 31981	BZX79-C3V9

TRANSISTORS

7820	4822 130 60887	BF840
7821	5322 130 41982	BC848 (CHIP)
7822	5322 130 41983	BC858B(CHIP)
7823	5322 130 41982	BC848 (CHIP)
7824	5322 130 41982	BC848 (CHIP)
7825	4822 130 42675	BC818
7826	5322 130 42012	BC858 (CHIP)
7827	4822 130 61207	BC848 (CHIP)
7828	4822 130 42616	BC818-40 (UAW)
7829	5322 130 42012	BC858 (CHIP)
7830	4822 130 42616	BC818-40 (UAW)
7831	5322 130 42012	BC858 (CHIP)
7832	4822 130 83031	BPW85

INTEGRATED CIRCUITS

7800	4822 209 31064	TDA1301T/N1
7801	4822 209 71579	TY40408
7802	4822 209 72587	TCA372DP2
7803	4822 209 72587	TCA372DP2
7804	4822 209 32036	UM6264BM-10L, RAM
7805	4822 209 30388	SAA7341GP
7806	4822 209 32419	MC68HC05D9-CDC MODUL
7807	4822 209 72587	TCA372DP2
7808	4822 209 83274	NJM4560D
7809	4822 209 83274	NJM4560D
7810	4822 209 71579	TY40408

COILS

1801	4822 242 81151	X-TAL 16,934MHz
1802	4822 242 73557	CERAMIC RES. 8,46MHz
1840	4822 242 72527	CERAMIC RES. 4.0 MHz
5801	4822 157 53447	BEAD INDUCTOR
5802	4822 157 53447	BEAD INDUCTOR

RESISTORS

3800	4822 116 52239	120k	5%	0,5W
3801	4822 116 52233	10k	5%	0,5W
3802	4822 116 52239	120k	5%	0,5W
3803	4822 116 52233	10k	5%	0,5W
3804	4822 116 52291	56k	5%	0,5W
3805	4822 116 52233	10k	5%	0,5W
3806	4822 116 52233	10k	5%	0,5W
3807	4822 116 52233	10k	5%	0,5W
3808	4822 116 52233	10k	5%	0,5W
3809	4822 052 10478	4R7	5%	NFR
3810	4822 052 10478	4R7	5%	NFR
3812	4822 050 11002	1k	5%	0,2W
3813	4822 050 11002	1k	5%	0,2W
3814	4822 116 52233	10k	5%	0,5W
3815	4822 116 52175	100R	5%	0,5W
3817	4822 116 52244	15k	5%	0,5W
3818	4822 116 52244	15k	5%	0,5W
3821	4822 116 52283	4k7	5%	0,5W
3822	4822 116 52233	10k	5%	0,5W
3824	4822 052 10229	22R	5%	0,33W
3825	4822 116 52244	15k	5%	0,5W
3826	4822 116 52244	15k	5%	0,5W
3828	4822 116 52296	6k8	5%	0,5W
3829	4822 116 52233	10k	5%	0,5W
3830	4822 052 10229	22R	5%	0,33W
3832	4822 116 52244	15k	5%	0,5W
3833	4822 052 10478	4R7	5%	NFR
3835	4822 116 52296	6k8	5%	0,5W
3836	4822 116 52233	10k	5%	0,5W
3837	4822 052 10478	4R7	5%	NFR
3838	4822 052 10229	22R	5%	0,33W
3839	4822 116 52175	100R	5%	0,5W
3840	4822 116 52277	39k	5%	0,5W
3841	4822 050 11002	1k	5%	0,2W
3842	4822 116 52175	100R	5%	0,5W
3843	4822 116 52249	1k8	5%	0,16W
3844	4822 116 52175	100R	5%	0,5W
3850	4822 050 11002	1k	5%	0,2W
3852	4822 116 52175	100R	5%	0,5W
3853	4822 116 52249	1k8	5%	0,16W
3854	4822 050 11002	1k	5%	0,2W
3856	4822 116 52256	2k2	5%	0,16W
3860	4822 050 11002	1k	5%	0,2W
3861	4822 050 22205	2M2	1%	0,6W
3862	4822 116 52256	2k2	5%	0,16W
3863	4822 052 10338	3R3	NFR25	
3865	4822 116 52226	560R	5%	0,5W
3868	4822 116 52284	47k	5%	0,5W
3869	4822 116 52234	100k	5%	0,5W
3873	4822 116 52257	22k	5%	0,5W
3874	4822 116 52284	47k	5%	0,5W
3876	4822 052 10229	22R	5%	0,33W
3878	4822 052 10229	22R	5%	0,33W
3879	4822 116 52269	3k3	5%	0,5W
3880	4822 050 21503	15k	1%	0,6W
3881	4822 050 21503	15k	1%	0,6W
3882	4822 116 52257	22k	5%	0,5W
3883	4822 050 11002	1k	5%	0,2W
3884	4822 116 52257	22k	5%	0,5W
3885	4822 116 52244	15k	5%	0,5W

RESISTORS

3886	4822 116 52251	18k	5%	0,5W
3887	4822 116 52238	12k	5%	0,5W
3888	4822 050 21503	15k	1%	0,6W
3889	4822 050 21503	15k	1%	0,6W
3890	4822 050 11002	1k	5%	0,2W
3891	4822 052 10229	22R	5%	0,33W
3892	4822 052 10229	22R	5%	0,33W
3893	4822 116 52233	10k	5%	0,5W
3894	4822 116 52233	10k	5%	0,5W
3895	4822 116 52233	10k	5%	0,5W
3896	4822 116 52251	18k	5%	0,5W
3897	4822 116 52238	12k	5%	0,5W
3898	4822 050 21503	15k	1%	0,6W
3899	4822 116 52226	560R	5%	0,5W
3901	4822 116 52233	10k	5%	0,5W
3905	4822 116 52233	10k	5%	0,5W
3906	4822 116 52233	10k	5%	0,5W
3907	4822 116 52233	10k	5%	0,5W
4800	4822 050 11002	1k	5%	0,2W
4801	4822 050 21503	15k	1%	0,6W
4802	4822 116 52257	22k	5%	0,5W
4803	4822 116 52244	15k	5%	0,5W
4804	4822 050 21503	15k	1%	0,6W
4805	4822 050 21503	15k	1%	0,6W
4806	4822 050 11002	1k	5%	0,2W
4807	4822 116 52269	3k3	5%	0,5W
4808	4822 116 52257	22k	5%	0,5W
4813	4822 116 52233	10k	5%	0,5W
4814	4822 116 52233	10k	5%	0,5W
4817	4822 116 52233	10k	5%	0,5W
4819	4822 116 52233	10k	5%	0,5W
4820	4822 052 10478	4R7	5%	NFR
4824	4822 116 52233	10k	5%	0,5W
4825	4822 116 52233	10k	5%	0,5W
4826	4822 116 52233	10k	5%	0,5W
4828	4822 116 52238	12k	5%	0,5W
4829	4822 116 52238	12k	5%	0,5W
4830	4822 052 10108	1R	5%	0,33W
4831	4822 116 52276	3k9	5%	0,5W
4832	4822 116 52238	12k	5%	0,5W
4834	4822 052 10108	1R	5%	0,33W
4835	4822 052 10229	22R	5%	0,33W
4836	4822 052 10108	1R	5%	0,33W
4837	4822 052 10108	1R	5%	0,33W
4840	4822 116 52233	10k	5%	0,5W
4847	4822 116 52233	10k	5%	0,5W
4848	4822 116 52233	10k	5%	0,5W
4849	4822 116 52233	10k	5%	0,5W
4850	4822 116 52231	820R	5%	0,5W
4851	4822 116 52238	12k	5%	0,5W
4853	4822 116 52238	12k	5%	0,5W
4854	4822 116 52238	12k	5%	0,5W
4855	4822 052 10229	22R	5%	0,33W
4856	4822 052 10108	1R	5%	0,33W
4857	4822 116 52284	47k	5%	0,5W
4858	4822 116 52284	47k	5%	0,5W
4859	4822 052 10108	1R	5%	0,33W
4892	4822 116 52217	270R	5%	0,5W
4893	4822 116 52217	270R	5%	0,5W

CHIP RESISTORS

3811	4822 051 20105	1M	5%	0,1W
3816	4822 051 20103	10k	5%	0,1W
3820	4822 051 20682	6k8	5%	0,1W
3827	4822 051 20103	10k	5%	0,1W
3831	4822 051 20153	15k	5%	0,1W
3834	4822 117 10362	7k5	1%	0,1W
3845	4822 051 20431	430R	5%	0,1W
3846	4822 051 20431	430R	5%	0,1W
3847	4822 051 20334	330k	5%	0,1W
3848	4822 051 20101	100R	5%	0,1W
3849	4822 051 20303	30k	5%	0,1W
3851	4822 051 20362	3k6	5%	0,1W
3855	4822 051 20431	430R	5%	0,1W
3857	4822 051 20223	22k	5%	0,1W
3858	4822 051 20223	22k	5%	0,1W
3864	4822 051 20105	1M	5%	0,1W
3866	4822 051 20182	1k8	5%	0,1W
3867	4822 051 20182	1k8	5%	0,1W
3871	4822 051 20104	100k	5%	0,1W
3875	4822 051 20392	3k9	5%	0,1W
3877	4822 051 20103	10k	5%	0,1W
4809	4822 051 20473	47k	5%	0,1W
4810	4822 051 20103	10k	5%	0,1W
4811	4822 051 20103	10k	5%	0,1W
4812	4822 051 20103	10k	5%	0,1W
4815	4822 051 20103	10k	5%	0,1W
4818	4822 051 20332	3k3	5%	0,1W
4821	4822 051 20561	560R	5%	0,1W
4822	4822 051 10102	1k	2%	0,25W
4823	4822 051 20224	220k	5%	0,1W
4827	4822 051 20223	22k	5%	0,1W
4833	4822 051 20123	12k	2%	0,1W
4838	4822 051 20103	10k	5%	0,1W
4841	4822 051 20103	10k	5%	0,1W
4842	4822 051 20224	220k	5%	0,1W
4843	4822 051 20562	5k6	5%	0,1W
4852	4822 051 20123	12k	2%	0,1W
4860	4822 051 10102	1k	2%	0,25W
4861	4822 051 20471	470R	5%	0,1W
4862	4822 051 20471	470R	5%	0,1W
4863	4822 051 10008	CHIP JUMPER 1206		
4864	4822 051 20561	560R	5%	0,1W
4877	4822 051 10008	CHIP JUMPER 1206		
4878	4822 051 10008	CHIP JUMPER 1206		
4881	4822 051 10008	CHIP JUMPER 1206		
4882	4822 051 10008	CHIP JUMPER 1206		
4883	4822 051 10008	CHIP JUMPER 1206		
4885	4822 051 10008	CHIP JUMPER 1206		
4886	4822 051 10008	CHIP JUMPER 1206		
4888	4822 051 10008	CHIP JUMPER 1206		
4889	4822 051 10008	CHIP JUMPER 1206		
4890	4822 051 20271	270R	5%	0,1W
4894	4822 051 10008	CHIP JUMPER 1206		
4895	4822 051 10008	CHIP JUMPER 1206		
4896	4822 051 10008	CHIP JUMPER 1206		
4897	4822 051 10008	CHIP JUMPER 1206		
4898	4822 051 10008	CHIP JUMPER 1206		
4899	4822 051 10008	CHIP JUMPER 1206		

CAPACITORS

2898	4822 124 40433	47µF	20%	25V

CHIP CAPACITORS

2844	5322 122 32452	47pF	5%	50V
2845	4822 122 33175	2,2nF	20%	50V
2847	4822 122 33496	100nF	10%	63V
2849	5322 126 10223	4,7nF	10%	63V
2850	4822 122 33496	100nF	10%	63V
2852	5322 122 32654	22nF	10%	63V
2854	5322 122 32659	33pF	5%	50V
2855	4822 122 33496	100nF	10%	63V
2860	5322 126 10223	4,7nF	10%	63V
2861	5322 126 10223	4,7nF	10%	63V
2862	5322 122 32452	47pF	5%	50V
2863	5322 122 32452	47pF	5%	50V
2864	4822 122 32542	47nF	10%	63V
2865	4822 122 33496	100nF	10%	63V
2868	4822 122 33177	10nF	20%	50V
2871	4822 122 33496	100nF	10%	63V
2872	4822 122 33496	100nF	10%	63V
2873	5322 122 31863	330pF	5%	50V
2875	4822 122 33496	100nF	10%	63V
2876	4822 122 33216	270pF	5%	50V
2878	4822 122 33481	1,8nF	5%	NP0
2879	4822 122 33496	100nF	10%	63V
2881	4822 122 33216	270pF	5%	50V
2883	5322 122 31863	330pF	5%	50V
2885	4822 122 33481	1,8nF	5%	NP0
2887	5322 122 32654	22nF	10%	63V
2888	4822 122 33496	100nF	10%	63V
2889	4822 122 33496	100nF	10%	63V
2890	4822 122 33496	100nF	10%	63V
2892	4822 122 33496	100nF	10%	63V
2893	4822 122 33496	100nF	10%	63V
2895	4822 122 33496	100nF	10%	63V
2902	4822 122 33496	100nF	10%	63V
2905	4822 122 33175	2,2nF	20%	50V
2906	5322 122 32452	47pF	5%	50V
2907	5322 122 32452	47pF	5%	50V
2800	4822 126 10326	180pF	5%	
2801	4822 126 10326	180pF	5%	
2802	5322 122 31863	330pF	5%	50V
2803	5322 122 31865	1,5nF	10%	63V
2804	5322 116 80853	560pF	5%	63V
2805	4822 122 33575	220pF	5%	50V
2806	4822 122 33575	220pF	5%	50V
2807	4822 122 33575	220pF	5%	50V
2808	4822 122 33575	220pF	5%	50V
2809	4822 122 33575	220pF	5%	50V
2810	4822 122 33575	220pF	5%	50V
2811	4822 122 33496	100nF	10%	63V
2813	5322 122 32654	22nF	10%	63V
2814	4822 122 33496	100nF	10%	63V
2815	4822 122 33496	100nF	10%	63V
2817	4822 126 10326	180pF	5%	
2818	4822 122 33496	100nF	10%	63V
2820	5322 126 10465	3,9nF	10%	63V
2821	4822 122 33496	100nF	10%	63V
2823	4822 122 33496	100nF	10%	63V
2824	4822 126 10326	180pF	5%	
2825	4822 122 32627	2,2nF	10%	50V
2826	4822 122 33496	100nF	10%	63V
2827	4822 122 33175	2,2nF	20%	50V

CHIP CAPACITORS

2828	4822 122 33496	100nF	10%	63V
2830	4822 122 33342	33nF	10%	63V
2831	4822 122 33496	100nF	10%	63V
2833	4822 122 33496	100nF	10%	63V
2835	4822 122 33496	100nF	10%	63V
2836	5322 122 32452	47pF	5%	50V
2837	5322 122 32452	47pF	5%	50V
2838	5322 122 32531	100pF	5%	50V
2839	5322 122 32965	18pF	5%	50V
2840	4822 126 10326	180pF	5%	
2842	5322 122 31863	330pF	5%	50V
2843	4822 126 10326	180pF	5%	
2856	4822 122 33496	100nF	10%	63V

ACCESSORIES

4822 321 10831	AC CORD /20, /21, /22
4822 321 10918	AC CORD /25
4822 321 10954	AC CORD /30
4822 321 10883	AC CORD /37
4822 218 10513	IR REMOTE CONTROL
4822 445 10362	SPEAKER AS640/20, /22, /25
4822 445 10365	SPEAKER AS640/37
4822 445 10366	SPEAKER AS640/20B, /21
4822 445 10366	SPEAKER AS645/21, /30
4822 445 10368	SPEAKER AS641/37, AS642/37

SET PARTS

1006	4822 130 83092	LED from Volume pot

CAPACITORS

2812	5322 124 21643	22µF	20%	40V
2819	5322 124 41431	22µF	20%	25V
2822	5322 124 41431	22µF	20%	25V
2829	5322 124 41431	22µF	20%	25V
2832	5322 124 41431	22µF	20%	25V
2834	5322 124 41431	22µF	20%	25V
2841	5322 124 21643	22µF	20%	40V
2846	4822 124 40849	330µF	20%	16V
2848	5322 121 42661	330nF	5%	63V
2851	4822 124 41584	100µF	20%	10V
2853	4822 124 40242	1µF	20%	63V
2859	4822 124 40242	1µF	20%	63V
2869	4822 124 40433	47µF	20%	25V
2870	4822 124 41584	100µF	20%	10V
2874	4822 124 40849	330µF	20%	16V
2877	4822 124 40246	4,7µF	20%	63V
2880	4822 124 40246	4,7µF	20%	63V
2882	4822 124 40246	4,7µF	20%	63V
2884	4822 124 40433	47µF	20%	25V
2886	4822 124 40433	47µF	20%	25V
2891	4822 124 40201	1000µF	20%	16V
2894	4822 124 40201	1000µF	20%	16V
2896	5322 124 41431	22µF	20%	25V
2897	4822 124 40433	47µF	20%	25V
2898	4822 124 40433	47µF	20%	25V

CHIP CAPACITORS

2800	4822 126 10326	180pF	5%	
2801	4822 126 10326	180pF	5%	
2802	5322 122 31863	330pF	5%	50V
2803	5322 122 31865	1,5nF	10%	63V
2804	5322 116 80853	560pF	5%	63V
2805	4822 122 33575	220pF	5%	50V
2806	4822 122 33575	220pF	5%	50V
2807	4822 122 33575	220pF	5%	50V
2808	4822 122 33575	220pF	5%	50V
2809	4822 122 33575	220pF	5%	50V
2810	4822 122 33575	220pF	5%	50V
2811	4822 122 33496	100nF	10%	63V
2813	5322 122 32654	22nF	10%	63V
2814	4822 122 33496	100nF	10%	63V
2815	4822 122 33496	100nF	10%	63V
2817	4822 126 10326	180pF	5%	
2818	4822 122 33496	100nF	10%	63V
2820	5322 126 10465	3,9nF	10%	63V
2821	4822 122 33496	100nF	10%	63V
2823	4822 122 33496	100nF	10%	63V
2824	4822 126 10326	180pF	5%	
2825	4822 122 32627	2,2nF	10%	50V
2826	4822 122 33496	100nF	10%	63V
2827	4822 122 33175	2,2nF	20%	50V
2828	4822 122 33496	100nF	10%	63V
2830	4822 122 33342	33nF	10%	63V
2831	4822 122 33496	100nF	10%	63V
2833	4822 122 33496	100nF	10%	63V
2835	4822 122 33496	100nF	10%	63V
2836	5322 122 32452	47pF	5%	50V
2837	5322 122 32452	47pF	5%	50V
2838	5322 122 32531	100pF	5%	50V
2839	5322 122 32965	18pF	5%	50V
2840	4822 126 10326	180pF	5%	

CHIP CAPACITORS

2842	5322 122 31863	330pF	5%	50V
2843	4822 126 10326	180pF	5%	
2844	5322 122 32452	47pF	5%	50V
2845	4822 122 33175	2,2nF	20%	50V
2847	4822 122 33496	100nF	10%	63V
2849	5322 126 10223	4,7nF	10%	63V
2850	4822 122 33496	100nF	10%	63V
2852	5322 122 32654	22nF	10%	63V
2854	5322 122 32659	33pF	5%	50V
2855	4822 122 33496	100nF	10%	63V
2856	4822 122 33496	100nF	10%	63V
2860	5322 126 10223	4,7nF	10%	63V
2861	5322 126 10223	4,7nF	10%	63V
2862	5322 122 32452	47pF	5%	50V
2863	5322 122 32452	47pF	5%	50V
2864	4822 122 32542	47nF	10%	63V
2865	4822 122 33496	100nF	10%	63V
2868	4822 122 33177	10nF	20%	50V
2871	4822 122 33496	100nF	10%	63V
2872	4822 122 33496	100nF	10%	63V
2873	5322 122 31863	330pF	5%	50V
2875	4822 122 33496	100nF	10%	63V
2876	4822 122 33216	270pF	5%	50V
2878	4822 122 33481	1,8nF	5%	NP0
2879	4822 122 33496	100nF	10%	63V
2881	4822 122 33216	270pF	5%	50V
2883	5322 122 31863	330pF	5%	50V
2885	4822 122 33481	1,8nF	5%	NP0
2887	5322 122 32654	22nF	10%	63V
2888	4822 122 33496	100nF	10%	63V
2889	4822 122 33496	100nF	10%	63V
2890	4822 122 33496	100nF	10%	63V
2892	4822 122 33496	100nF	10%	63V
2893	4822 122 33496	100nF	10%	63V
2895	4822 122 33496	100nF	10%	63V
2905	4822 122 33175	2,2nF	20%	50V
2906	5322 122 32452	47pF	5%	50V
2907	5322 122 32452	47pF	5%	50V

ACCESSORIES

4822 321 10831	AC CORD /20, /21, /22
4822 321 10918	AC CORD /25
4822 321 10954	AC CORD /30
4822 321 10883	AC CORD /37
4822 218 10513	IR REMOTE CONTROL
4822 445 10362	SPEAKER BOX AS640/20, /22, /25
4822 445 10365	SPEAKER BOX AS640/37
4822 445 10366	SPEAKER BOX AS640/20B, /21
4822 445 10366	SPEAKER BOX AS645/21, /30
4822 445 10368	SPEAKER BOX AS641/37, AS642/37

SET PARTS

1006	4822 130 83092	LED from Volume pot

4720

AS640, AS641, AS642, AS645

A93-367

Service
Service
Service

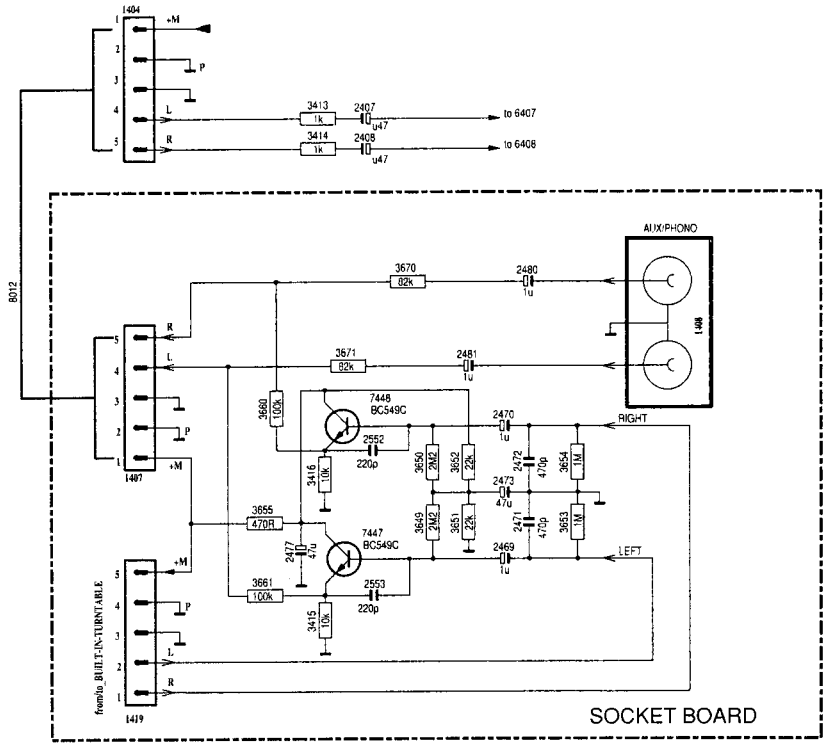
Product Service Group CE Audio

Service Information

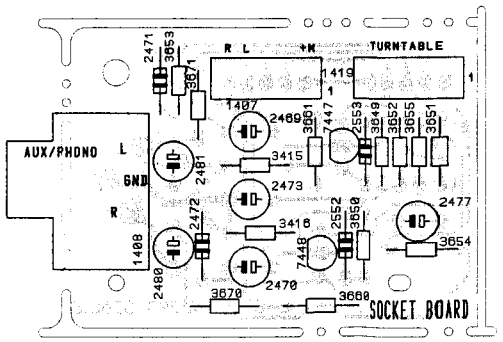
Already published Service Informations: *A93-360 (4822 725 24909)*

Fault: Playback of a record isn´t possible if an external source is connected to the AUX/PHONO socket (1408). **Only valid for sets with internal record player.**

Therefore the circuit diagram and the component layout have been changed from production week 9344 onwards.



Component side view



Capacitors 2480 and 2481(1µF) have been added. Service code **4822 124 40242**.
Resistors 3413 and 3414 have been changed to 1kΩ. Service code **4822 050 11002**.
Resistors 3660 and 3661 have been changed to 100kΩ. Service code **4822 116 52234**.
Resistors 3670 and 3671(82kΩ) have been added. Service code **4822 116 52304**.

- For reasons of standardisations the headphone socket has been changed to **4822 267 40659**.
  Introduction date: Week 9336.

- To reduce residual noise the value of the motorpot has been changed to 50kΩ. (**4822 101 90248**)
  Introduction date: Week 9336.

- To iprove frequency response of the *POWER BOARD*, capacitors 2323 and 2324 have been changed to 1n5 (**4822 126 12878**).
  Introduction date: Week 9332.

- To increase the input level for the *RECORDER BOARD*, resistors 3437 and 3438 have been changed to 18kΩ. (**4822 116 52264**)
  Introduction date: Week 9332.

- **Fault:** "Ticking noise" is audible during record from CD.

  Solution: Following changes have been done on the *FRONT BOARD*.

Resistors 3405,3406 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3437,3438 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3605,3606 have been changed to 1k0.	Service code **4822 050 11002**.
Resistor 3609 has been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3607,3608 have been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3407,3408 have been changed to 270Ω.	Service code **4822 116 52217**.
Capacitor 2468 has been changed to 47µF.	Service code **4822 124 40433**.

  Introduction date: Week 9336.

- Correction to the Service Manual
  Dismantling hints - picture 6 on page 11.
  Colour of wires to the stand by LED has been interchanged from production start onwards.
  Correct is: long pin of LED connected to the grey wire
  short pin of LED connected to the black wire

- Due to cost reduction following changes have been done on the *POWER BOARD*.
  Introduction date: Week 9336.

  - Capacitors 2325 and 2326 have been changed to 100µF. Service code **4822 124 41525**.
  - The complete ***switch on mute*** circuit has been deleted. (7350, 7351, 3351, 3352, 3353, 6352, 2357)
  - Resistor 3264 has been replaced by a wire bridge.

- Except for the /21, /22 and /30 versions
  - Coils 5309, 5311, 5312, 5315 and 5316 have been replaced by wire bridges.
  - Resistors 3323, 3324, 3325 and 3326 have been replaced by wire bridges too.
  - Capacitors 2266, 2267, 2321 and 2322 have been deleted.

  (These components are only necessary to fulfil FTZ requirements.)

- Due to cost reduction pos. 501 (see exploded view of set) has been omitted. Therefore pos. 401 (side left) has been adapted.
  Introduction date: Week 9336.

Survey of changes - ECO 4 tuner board

Introduction date	Change						Service Code	Reason
Wk 9333	3148	from	47k	to	100k		4822 100 11163	to ease VCO adjustment
	3149	from	68k	to	56k		4822 051 20563	
	3186	from	47k	to	100k		-	increase of search sensitivity (back to normal level)
	3112	from	27k	to	22k		-	reduction of distortion in STEREO mode
Wk 9328	3112	from	22k	to	24k		-	to adapt STEREO switching level.
Wk 9329	7140	from	TEA5712T/**N1**	to	TEA5712T/**N2**			
	pcb	from stage **.3**		to stage **.4**				adaptions for TEA5712T/**N2**
	3112	from	24k	to	22k		4822 051 20223	
	3157	from	47k	to	27k		4822 051 20273	
	3159	from	10k	to	180k		4822 051 20184	
	2193	100nF added					4822 122 33496	"search sensitivity circuit" changed
	3178	from	100k	to	3k3		4822 051 20332	because of TEA5712T/**N2**
	3179	from	22k	to	27k		-	
	3185	from	100k	to	4k7		4822 051 20472	
	3186	from	100k	to	18k		4822 051 20183	
	3200	22k added					4822 051 20223	
	3235	chip jumper 1206 added					4822 051 90010	
	7169	from	BC858B	to	BC848C		5822 130 42136	
Wk 9335	2154	from	2n2	to	10n		4822 122 33177	reduction of total harmonic distortion
					(USA /17)	15n	4822 122 33128	
	2155	from	2n2	to	10n		4822 122 33177	
					(USA /17)	15n	4822 122 33128	
	2158	from	1n	to	180p		4822 122 31768	
		(USA/17)	680p	to	180p		4822 122 31768	
	2159	from	1n	to	180p		4822 122 31768	
		(USA/17)	680p	to	180p		4822 122 31768	
	5171	coil changed to resistor 3198, 10R						improve S/N on LW 153kHz
Wk 9334	3179	from	27k	to	100k		4822 051 20104	to increase FM search sensitivity
Wk 9350	cancellation of MUTE circuit							
Wk 9348	2133	from	10n	to	15n		4822 122 33128	to improve PLL behaviour when jumping the whole frequency range on LW from 150kHz to 279kHz
	2138	from	22p	to	33p		4822 122 32659	
	2139	from	2n7	to	3n3		4822 122 33891	
	3128	from	2k2	to	10k		4822 051 20103	
	3193	from	470R	to	2k2		4822 116 52249	

Survey of changes - ECO 4 tuner board

Introduction date	Change					Service Code	Reason
Wk 9333	3148	from	47k	to	100k	4822 100 11163	to ease VCO adjustment
	3149	from	68k	to	56k	4822 051 20563	
	3186	from	47k	to	100k	-	increase of search sensitivity (back to normal level)
	3112	from	27k	to	22k	-	reduction of distortion in STEREO mode
Wk 9328	3112	from	22k	to	24k	-	to adapt STEREO switching level
Wk 9329	7140	from	TEA5712T/**N1**	to	TEA5712T/**N2**		
	pcb	from stage **.3**		to stage **.4**			adaptions for TEA5712T/**N2**
	3112	from	24k	to	22k	4822 051 20223	
	3157	from	47k	to	27k	4822 051 20273	
	3159	from	10k	to	180k	4822 051 20184	
	2193	100nF added				4822 122 33496	"search sensitivity circuit" changed
	3178	from	100k	to	3k3	4822 051 20332	because of TEA5712T/**N2**
	3179	from	22k	to	27k	-	
	3185	from	100k	to	4k7	4822 051 20472	
	3186	from	100k	to	18k	4822 051 20183	
	3200	22k added				4822 051 20223	
	3235	chip jumper 1206 added				4822 051 90010	
	7169	from	BC858B	to	BC848C	5822 130 42136	
Wk 9335	2154	from	2n2	to	10n	4822 122 33177	reduction of total harmonic distortion
					(USA /17) 15n	4822 122 33128	
	2155	from	2n2	to	10n	4822 122 33177	
					(USA /17) 15n	4822 122 33128	
	2158	from	1n	to	180p	4822 122 31768	
		(USA/17)	680p	to	180p	4822 122 31768	
	2159	from	1n	to	180p	4822 122 31768	
		(USA/17)	680p	to	180p	4822 122 31768	
	5171	coil changed to resistor 3198, 10R					improve S/N on LW 153kHz
Wk 9334	3179	from	27k	to	100k	4822 051 20104	to increase FM search sensitivity
Wk 9350	cancellation of MUTE circuit						
Wk 9348	2133	from	10n	to	15n	4822 122 33128	to improve PLL behaviour when jumping the whole frequency range on LW from 150kHz to 279kHz
	2138	from	22p	to	33p	4822 122 32659	
	2139	from	2n7	to	3n3	4822 122 33891	
	3128	from	2k2	to	10k	4822 051 20103	
	3193	from	470R	to	2k2	4822 116 52249	

- For reasons of standardisations the headphone socket has been changed to **4822 267 40659**.
  Introduction date: Week 9336.

- To reduce residual noise the value of the motorpot has been changed to 50kΩ. (**4822 101 90248**)
  Introduction date: Week 9336.

- To iprove frequency response of the *POWER BOARD*, capacitors 2323 and 2324 have been changed to 1n5 (**4822 126 12878**).
  Introduction date: Week 9332.

- To increase the input level for the *RECORDER BOARD*, resistors 3437 and 3438 have been changed to 18kΩ. (**4822 116 52264**)
  Introduction date: Week 9332.

- **Fault:** "Ticking noise" is audible during record from CD.

  Solution: Following changes have been done on the *FRONT BOARD*.

Resistors 3405,3406 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3437,3438 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3605,3606 have been changed to 1k0.	Service code **4822 050 11002**.
Resistor 3609 has been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3607,3608 have been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3407,3408 have been changed to 270Ω.	Service code **4822 116 52217**.
Capacitor 2468 has been changed to 47µF.	Service code **4822 124 40433**.

  Introduction date: Week 9336.

- Correction to the Service Manual
  Dismantling hints - picture 6 on page 11.
  Colour of wires to the stand by LED has been interchanged from production start onwards.
  Correct is: long pin of LED connected to the grey wire
  short pin of LED connected to the black wire

- Due to cost reduction following changes have been done on the *POWER BOARD*.
  Introduction date: Week 9336.

  - Capacitors 2325 and 2326 have been changed to 100µF. Service code **4822 124 41525**.
  - The complete ***switch on mute*** circuit has been deleted. (7350, 7351, 3351, 3352, 3353, 6352, 2357)
  - Resistor 3264 has been replaced by a wire bridge.

- Except for the /21, /22 and /30 versions
  - Coils 5309, 5311, 5312, 5315 and 5316 have been replaced by wire bridges.
  - Resistors 3323, 3324, 3325 and 3326 have been replaced by wire bridges too.
  - Capacitors 2266, 2267, 2321 and 2322 have been deleted.

  (These components are only necessary to fulfil FTZ requirements.)

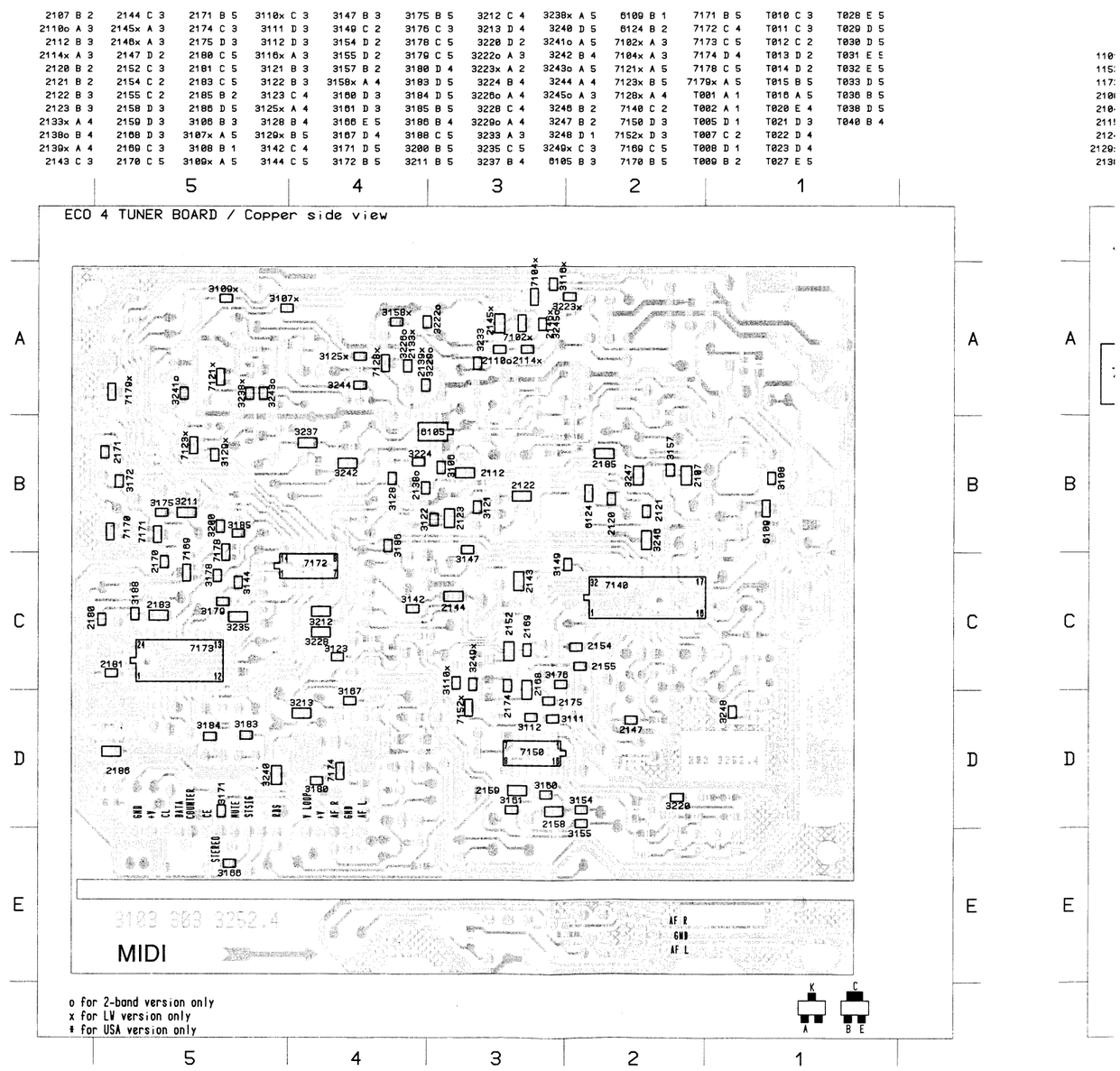
- Due to cost reduction pos. 501 (see exploded view of set) has been omitted. Therefore pos. 401 (side left) has been adapted.
  Introduction date: Week 9336.

TUNER Adjustment table (ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM 87.5 - 108MHz			108 MHz	5120	1	8V ± 0.2V
			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8V ± 0.4V
MW 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123		9V±0.1V (7.5±0.7V) 1)
			530kHz	check		1V±0.4V (1.1±0.5V) 1)
LW 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V) 1)
			153kHz	check		1V±0.4V (1.1±0.5V) 1)
MW 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.5±0.5V) 1)
			522kHz	check		1V±0.4V (1.1±0.5V) 1)
FM - RF						
FM	108MHz	A mod=1kHz Δf=22.5kHz	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz		108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B mod=1kHz 30% AM	198kHz	5122	4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz		1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.
1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

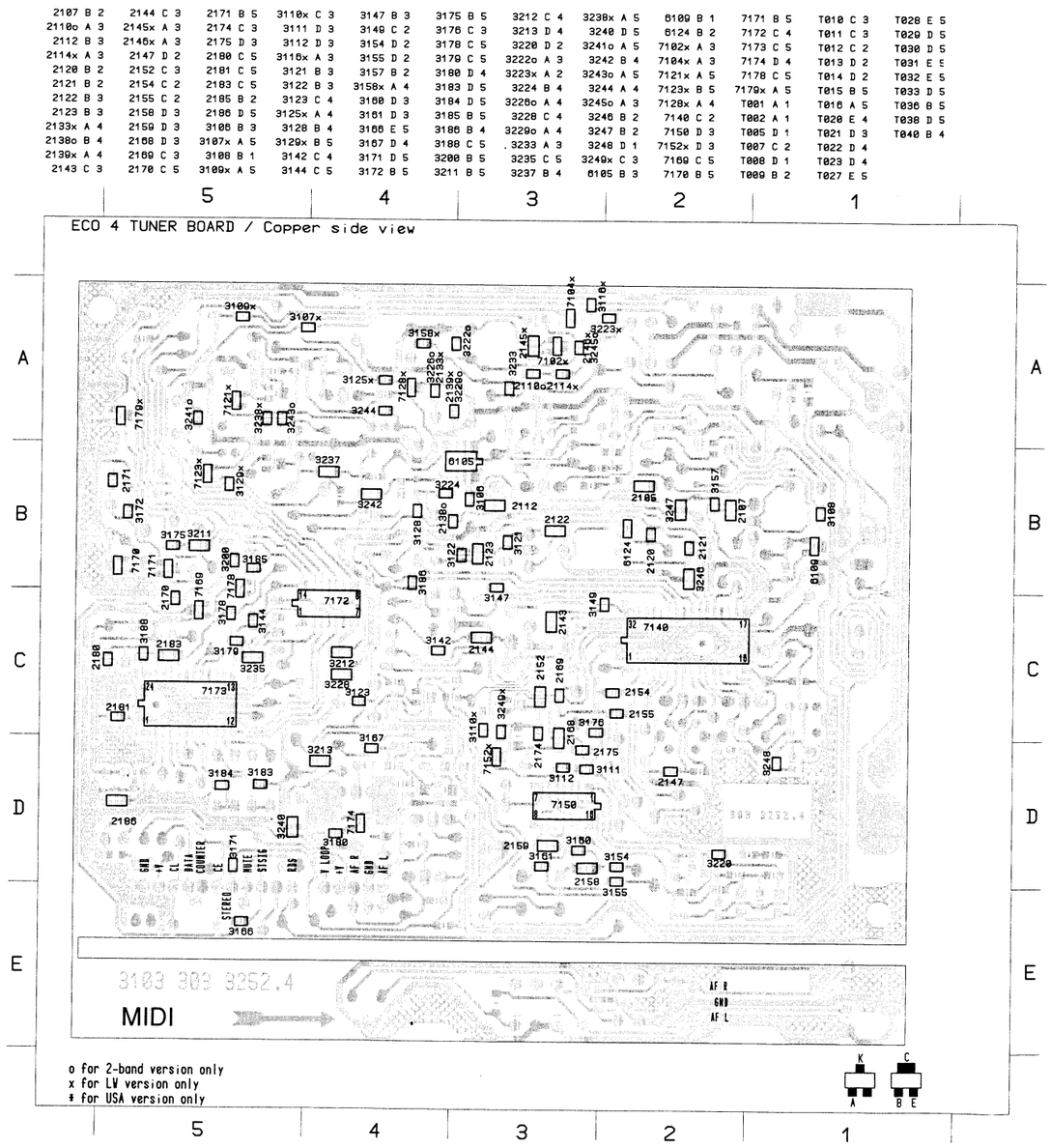
Component layout

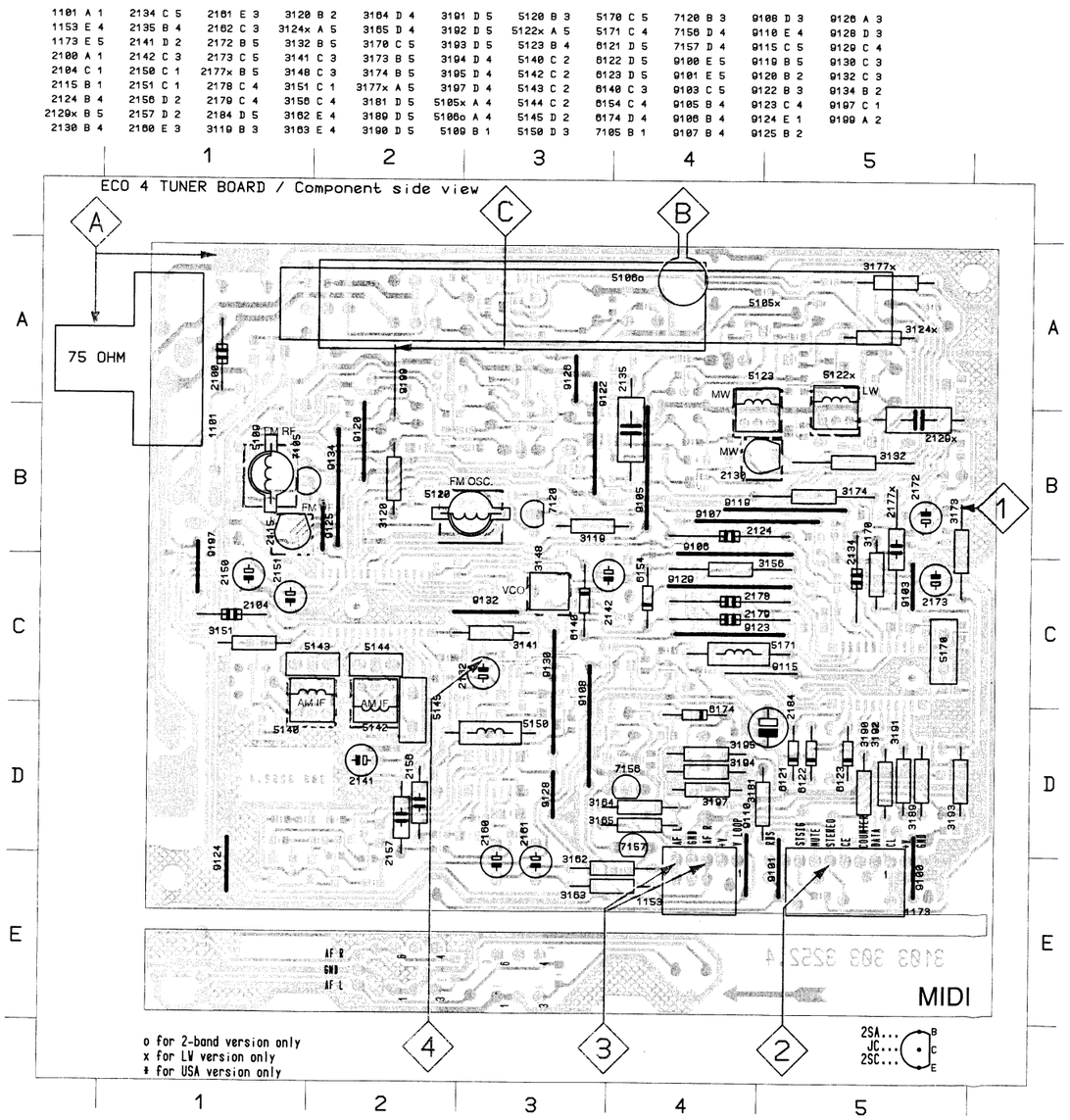


Component layout

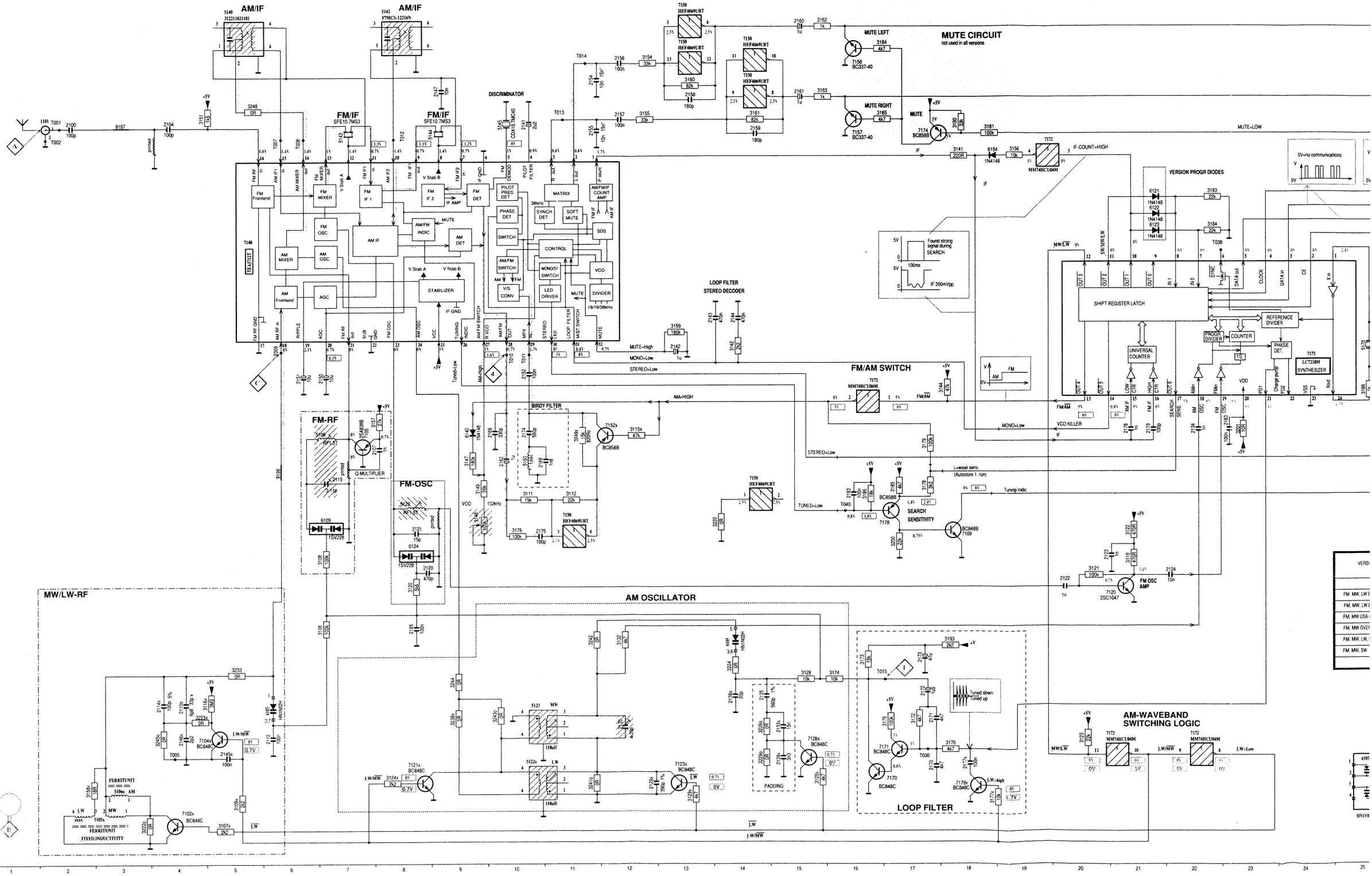
Scope / Voltmeter
8V ± 0.2V
4.1V ± 0.5V
8V ± 0.2V
0.8V ± 0.4V
√±0.1V (7.5±0.7V)[1]
√±0.4V (1.1±0.5V)[1]
√±0.2V (7.5±1.5V)[1]
√±0.4V (1.1±0.5V)[1]
√±0.1V (7.5±0.5V)[1]
√±0.4V (1.1±0.5V)[1]
MAX
152kHz ± 1kHz
symmetrical and max height
MAX
MAX

ju. automatically.
ue stated within





TUNER UNIT ECO4 (MIDI)



CS 51 864

MUTE CIRCUIT

not used in all versions

FM/AM SWITCH

LOOP FILTER STEREO DECODER

BIRDY FILTER

AM OSCILLATOR

AM-WAVEBAND SWITCHING LOGIC

LOOP FILTER

STABILIZING CIRCUIT +5V

VERSION PROGR DIODES

VERSION PROGRAMMING DIODES			
	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED

o for 2-band version only

x for LW version only

* for USA version only

HEF 4069 UBT
MM 74HCU04M

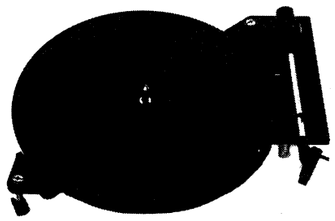
HN1V02H

Record player DL-40

3139 118 72550

Service
Service
Service

Service Manual



Specification

Power supply:	12V dc at 80mA
Wow and flutter:	0.25% JIS
	0.35% DIN
Operating speed:	33 1/3 - 45rpm
Drive system:	Belt drive with auto return

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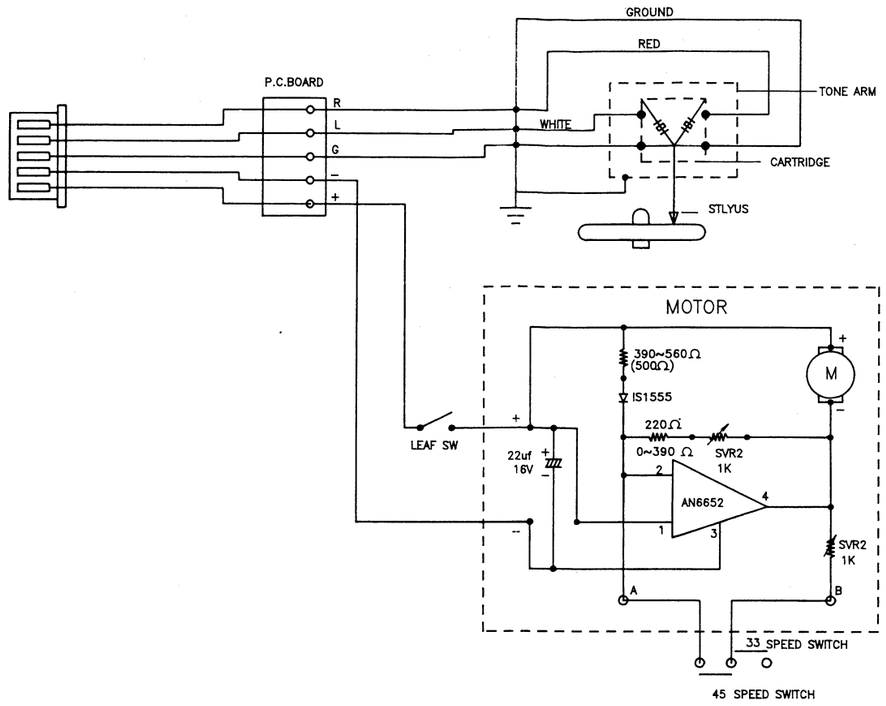
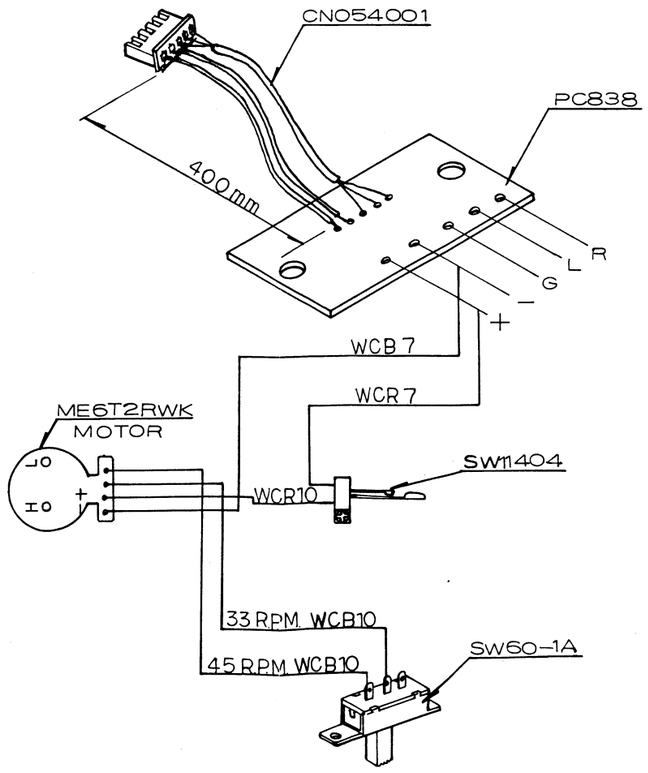
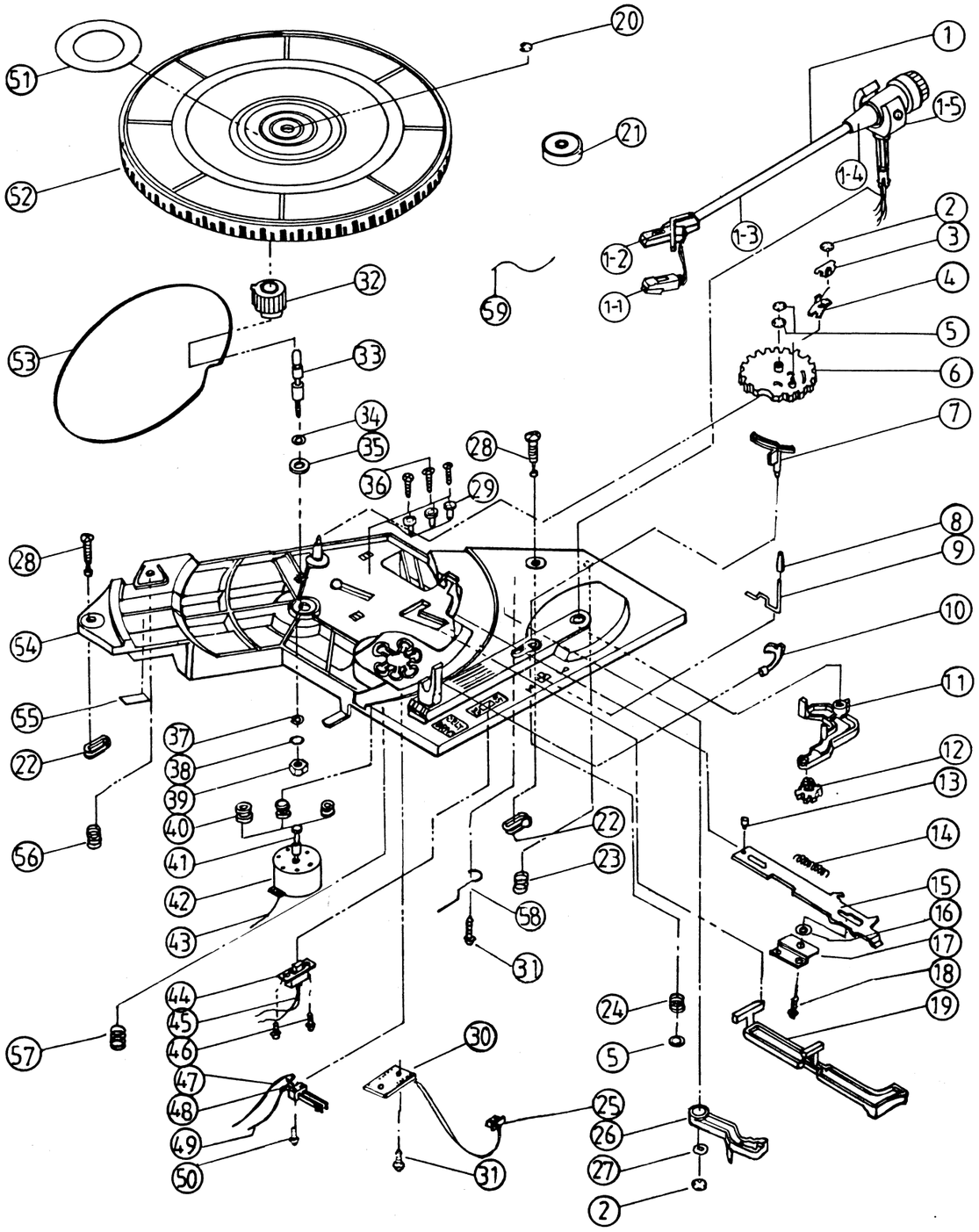
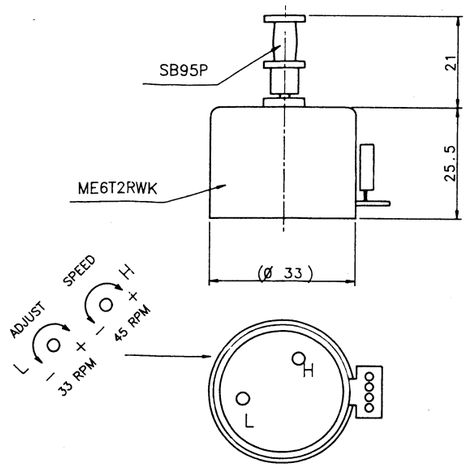
4822 725 23237



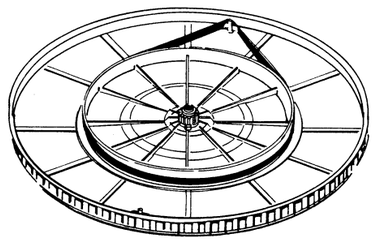


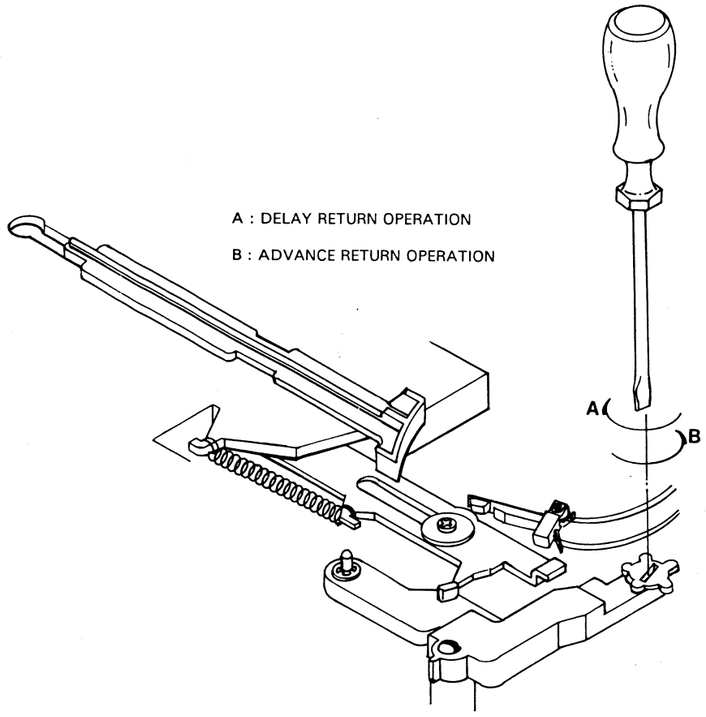
EXPLODED VIEW





PLACEMENT OF BELT



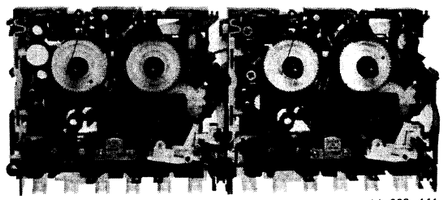


01	4822 251 70328
1-1	4822 251 30153
02	4822 530 80538
05	4822 530 80539
06	4822 522 33247
07	4822 402 61417
08	4822 462 41916
09	4822 402 61413
10	4822 402 61416
11	4822 402 61414
12	4822 402 61415
14	4822 492 71081
22	4822 492 71082
23	4822 492 71079
24	4822 492 71077
26	4822 466 93093
27	4822 532 52438
28	4822 502 13959
29	4822 532 52302
32	4822 522 33225
34	4822 532 52439
35	4822 532 52434
37	4822 532 52449
40	4822 462 71829
41	4822 528 50332
42	4822 361 21305
44	4822 277 21596
48	4822 276 13251
51	4822 460 20803
52	4822 528 10843
53	4822 358 31178
56	4822 492 71078
58	4822 492 71095

Note : Only the mentioned parts are normal service parts.

Tape transport RDN11

Service
Service
Service


44 992 A11

For details and exploded view see Service Manual of tape transport RN/RR, RDN/RDR (general documentation)

Service Manual

(GB) MAINTENANCE

It is recommended to clean the recorder after approx. 500 hours of operation.

To be cleaned with alcohol or spirit

- Erase head
- Recording/playback head
- Capstan
- Pressure roller

(F) ENTRETIEN

L'appareil devra être nettoyé après env. 500 heures de marche aux points les plus importants.

Nettoyer les éléments suivants à l'alcool ou à l'alcool à brûler:

- Tête effacement
- Tête enregistrement/reproduction
- Cabestan
- Galet presseur

(NL) ONDERHOUD

Aanbevolen wordt het apparaat na ca. 500 bedrijfsuren schoon te maken

Schoonmaken met alcohol of spiritus:

- Wiskop
- Opneem-/weergeefkop
- Toonas
- Drukrol

(D) WARTUNG

Es empfiehlt sich, das Gerät nach ca. 500 Betriebsstunden zu reinigen

Reinigen mit Alkohol oder Spiritus:

- Löschkopf
- Aufnahme/Wiedergabe-Kopf
- Tonachse
- Andruckrolle

(I) MANUTENZIONE

E consigliabile pulire l'apparecchio dopo circa 500 ore di funzionamento ai punti principali.

Pulire con alcool

- Testina di cancellazione
- Testina di registrazione/riproduzione
- Capstan
- Rullo preminastro

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SPECIAL FEATURES

(GB) CONTINUOUS PLAY

Definition: "Play" starts on deck A (play back deck). After tape end on deck A, deck B (REC/PB – deck) will be going on with **"Play"** till tape end. Then both decks will be in **"Stop"**– mode due to full auto shut off.
Operating sequence:
1) start with **"Play"** on deck A
2) switch **"Pause"** on deck B
3) switch **"Play"** on deck B
After tape end on deck A auto stop – mechanism is working.The locked "play"– button on deck A and the "pause"– button on deck B will be released. "Play"– mode on deck B will now be active. After tape end on deck B full auto shut off will be activated.

SYNCHRO START

"COPY" from deck A to deck B
Operating sequence:
1) switch **"Pause"** on deck B
2) switch **"REC"**(one touch) on deck B
3) switch **"Play"** on deck A
In that moment when the "play"– button on deck A will be depressed the "pause"– button on deck B will be released. Now "REC"– mode on deck B will be active. Both decks will be working.
If one of the cassettes reaches tape end full auto shut off will be activated and COPY is finished.

(NL) ONONDERBROKEN WEERGEVEN

Omschrijving: Het weergeven begint op deck A (weergavedeck). Nadat op deck A het einde van de band is bereikt, gaat het weergeven door op deck B (opname/weergave–deck). Op dat moment worden beide decks geheel automatisch in de stand "Stop" geschakeld.
Bedieningsvolgorde:
1) druk op toets **"Play"** op deck A
2) druk op toets **"Pause"** op deck B
3) druk op toets **"Play"** op deck B
Nadat het einde van de band op deck A is bereikt, treedt het autostop–mechanisme in werking. De vergrendelde toets "Play" op deck A en de toets "Pause" op deck B worden dan vrijgegeven. De stand "Play" op deck B is nu geactiveerd. Nadat het einde van de band op deck B is bereikt, wordt de volledig automatische uitschakeling geactiveerd.

SYNCHROON STARTEN

"KOPIEREN" van deck A naar deck B
Bedieningsvolgorde:
1) druk op toets **"Pause"** op deck B
2) druk (een keer) op toets **"REC"** op deck B
3) druk op toets **"Play"** op deck A
Op het moment dat de toets "Play" op deck A wordt ingedrukt, wordt de toets "Pause" op deck B vrijgegeven. De stand "REC" op deck B is nu geactiveerd. Beide decks zijn in werking.
Indien op een van de cassettes het einde van de band wordt bereikt, wordt de volledig automatische uitschakeling geactiveerd en het kopiëren beëindigd.

(F) LECTURE EN CONTINU

Définition: La lecture ("**play**") démarre sur la platine A (platine de lecture). A l'arrivée en fin de bande sur la platine A, la platine B (platine d'enregistrement/lecture) poursuivra la lecture ("**play**") jusqu'à la fin de la bande. Ensuite, les deux platines seront en mode arrêt ("**stop**") grâce à l'arrêt total automatique.
Ordre de fonctionnement :
1) mettez en marche avec "**Play**" sur la platine A
2) appuyez sur "**Pause**" sur la platine B
3) appuyez sur "**Play**" sur la platine B

Après l'arrivée en fin de bande sur la platine A, le mécanisme d'arrêt automatique entre en fonctionnement. Les touches verrouillées "play" sur la platine A et "pause" sur la platine B sont alors débloquées. Le mode lecture ("play") sur la platine B est à présent actif. Après l'arrivée en fin de bande sur la platine B, l'arrêt total automatique sera activé. Lorsque la touche de "sélection de mode" est en position 2 (inversée), il est alors possible d'écouter trois faces de deux cassettes en continu.

DEPART SYNCHRONISE

Pour la COPIE de la platine A vers la platine B
Ordre de fonctionnement :
1) appuyez sur "**Pause**" sur la platine B
2) appuyez sur "**REC**" (enregistrement à une touche) sur la platine B
3) appuyez sur "**Play**" sur la platine A
Au moment où la touche "play" (lecture) sur la platine A sera enfoncée, la touche "pause" sur la platine B sera dégagée. Le mode "REC" (enregistrement) sur la platine B est à présent actif. Les deux platines fonctionnent.
Si l'une des cassettes arrive en fin de bande, l'arrêt total automatique sera activé et la COPIE terminée.

(D) CONTINUOUS PLAY

Definition: "Play" beginnt auf Laufwerk A (Wiedergabe –. Laufwerk). Am Bandende von Laufwerk A setzt Laufwerk B (Aufn./Wg – Laufwerk) mit "Play" fort und läuft bis Bandende. Danach sind beide Laufwerke abgeschaltet.
Bedienungsablauf:
1) **"Play"**– Taste auf Laufwerk A drücken
2) **"Pause"**– Taste auf Laufwerk B drücken
3) **"Play"**– Taste auf Laufwerk B drücken
Am Bandende von Laufwerk A arbeitet der Auto stop – Mechanismus. Die "Play"– Taste von Laufwerk A und die "Pause"– Taste von Laufwerk B werden gelöst. Auf Laufwerk B ist nun die "Play"– Funktion eingeschaltet. Am Bandende von Laufwerk B schaltet die automatische Endabschaltung ab.

SYNCHRO START

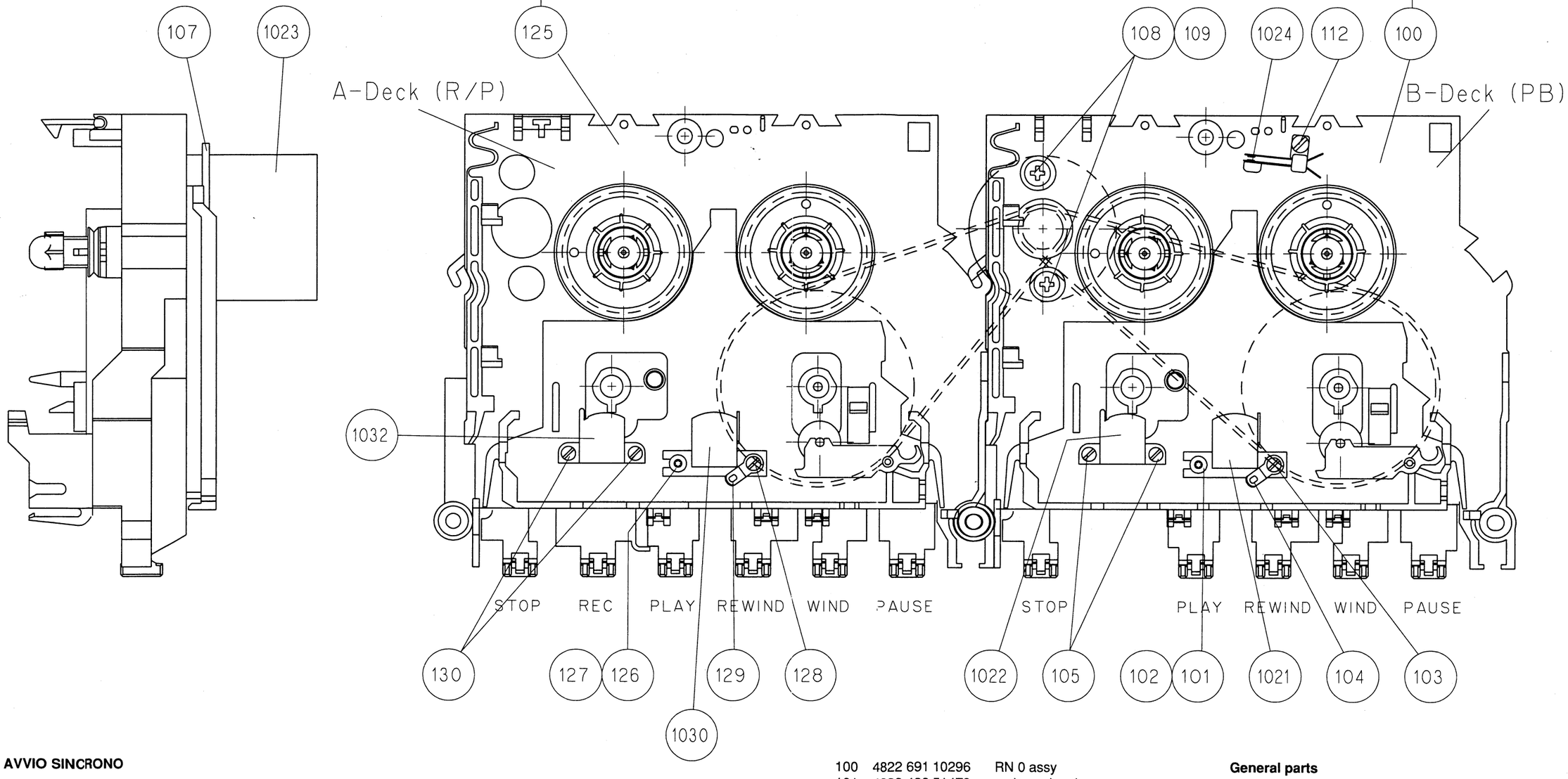
"Kopieren" von Laufwerk A auf Laufwerk B.
Bedienungsablauf:
1) **"Pause"**– Taste von Laufwerk B drücken
2) **"REC"**– Taste (one touch) von Laufwerk B drücken
3) **"Play"**– Taste von Laufwerk A drücken
In dem Moment wo die "Play"– Taste von Laufwerk A gedrückt wird, wird die "Pause"– Taste von Laufwerk B gelöst. "Aufnahme"– Modus wird dadurch auf Laufwerk B aktiviert und beide Laufwerke arbeiten.
Erreicht eine der beiden Kassetten das Bandende, schaltet die automatische Endabschaltung ab und der Kopierbetrieb wird beendet.

(I) RIPRODUZIONE CONTINUA

Funzionamento: la riproduzione inizia con la cassetta nel riproduttore A. Alla fine del nastro della cassetta nel riproduttore A, la riproduzione viene continuata con la cassetta nel registratore/riproduttore B. In tale momento, ambedue gli apparecchi vengono commutati automaticamente nel modo di arresto.
Ordine di comando:

1) premere il tasto **"Play"** sul riproduttore A
2) premere il tasto **"Pause"** sul registratore/riproduttore B
3) premere il tasto **"Play"** sul registratore/riproduttore B
Alla fine del nastro della cassetta nel riproduttore A, viene attivato il meccanismo di arresto automatico dello stesso. Viene rilasciato il tasto "Play" sul riproduttore A ed il tasto "Pause" sul registratore/riproduttore B. Viene avviata la riproduzione della cassetta nel registratore/riproduttore B. Quando è stata raggiunta la fine del nastro della cassetta nel registratore/riproduttore B, ambedue gli apparecchi vengono arrestati automaticamente.

STRIPPED VERS. WITHOUT NOTED ITEMS IS CALLED AND HANDLED AS **RN 0** 4822 691 10296



AVVIO SINCRONO

COPIATURA della cassetta nel riproduttore A sulla cassetta nel registratore/riproduttore B.
Ordine di comando:
1) premere il tasto "**PAUSE**" sul registratore/riproduttore B.
2) premere (una volta) il tasto "**REC**" sul registratore/riproduttore B.
3) premere il tasto "**PLAY**" sul riproduttore A.
Premendo il tasto "PLAY" sul riproduttore A verrà rilasciato il tasto "PAUSE" sul registratore/riproduttore B e quest'ultimo predisposto per la registratione. La cassetta nel riproduttore A viene copiata sulla cassetta nel registratore/riproduttore B. Quando viene raggiunta la fine del nastro diuna delle cassette, ambedue gli apparecchi vengono arrestati automaticamente.

100	4822 691 10296	RN 0 assy
101	4822 492 51473	spring azimuth
107	4822 529 10254	damper,motor
108	4822 502 11866	screw,motor
125	4822 691 10296	RN 0 assy
126	4822 492 51473	spring,azimuth
1021	4822 249 10397	head,Rec/Pb
1022	4822 404 10685	head,dummy
1023	4822 361 21637	motor, MSI-5U2LWDR
1024	4822 271 30598	switch indication play
1030	4822 249 10397	head,Rec/Pb
1032	4822 249 20072	head,erase

Only those parts of which a service code number is stated are service parts.

General parts

7/67	4822 520 10718	bearing plate
38	4822 520 40134	ball, bearing
40	4822 402 10037	lever, pinch roller right
41/76	4822 528 70646	pinch roller
43	4822 404 10853	slide, key lock
58	4822 358 30929	drive belt RN0 S (long)
98	4822 358 30928	drive belt RN0 D (short)
402	4822 528 20676	take-up clutch assy

(pos. number refer to exploded view in General Documentation 4822 725 23763)

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Product Service Group CE Audio

Service Information

Correction of Service Manual 4822 725 23792

The text in the table of contents and the exploded view (page 77) referring the tape transport is stated wrong.

Used tape transport is RDN11. The Manual in the annex is correct.

AS640, AS641, AS642, AS645

A94-350

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Product Service Group CE Audio

Service Information

Already published Service Informations: *A93-360 (4822 725 24909)*
A93-367 (4822 725 24919)

Correction of Service Manual 4822 725 23792.

Replace the CD Part (Page 59 - 70) respectively the Partslist (Page 91 - 93) by the following pages.

1994-02-23

GB 4822 725 2492